Volume XIV.
Number 2.

FEBRUARY, 1898.

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TEXTILE WORLD.

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CITY OF WASHINGTON

With which is Incorporated the

INDUSTRIAL RECORD

The Textile World's Complete Directory of Textile Establishments, the Mill Trade and of Large Buyers of Textile Fabrics, is presented to every paid-up subscriber. 360 pages, with 19 textile maps.

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GUILD & LORD, Publishers, 620 Atlantic Avenue, Boston, Mass.

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Bleaching, Dyeing, Drying and Finishing Machinery.

Cotton, Paper and Husk Rolls.

TENTERING MACHINES

With Patent Self-Feeding Clips.

Patent Combination Rolls

OF

HUSK AND COTTON.

Calenders, Mangles, Drying Machines, Tentering Machines, Hydraulic Presses, Etc.

—BEETLES—

Short and Long Chain Dyeing, Sizing and Drying Machines.

PATENT

OIL, COMBINED "PLATE and FLAME"

SINGEING MACHINES.

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PHILADELPHIA, - PA.

BLEACHING, PRINTING, DYEING AND FINISHING

MACHINERY.

Tentering Machines

VIBRATORY

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RETURN

— FOR ALL KINDS OF —

TEXTILE FABRICS.

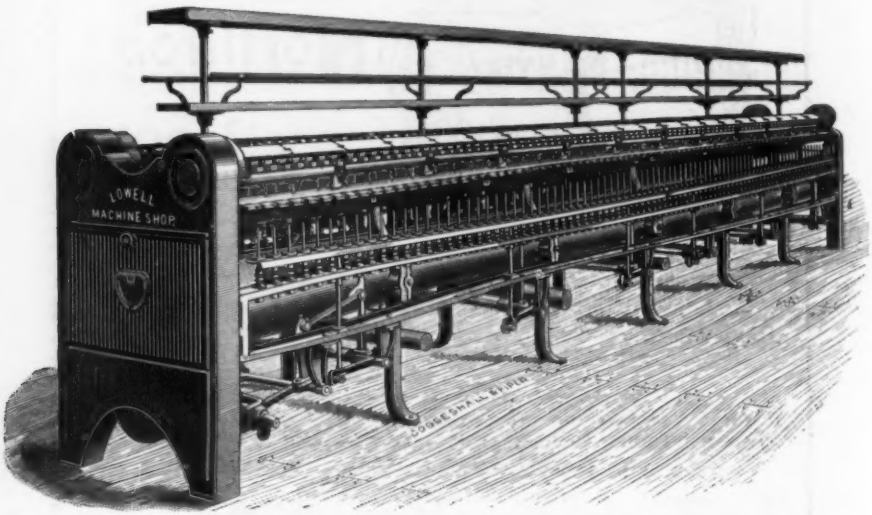
Patent Automatic Clamp, Spring Clamp, Pin Chain.

SPECIAL.

Tentering Machines with Adjustable Eccentric (Patent applied for) for imparting vibrating motion.

The above gives a uniformly smooth motion and the finish obtained on goods is of a superior character.

THE LOWELL RING FRAME.



All parts are made on special tools to standard sizes and are interchangeable.

The greatest care is taken to have the frames constructed so as to obtain the greatest production with the highest speed.

All spindles are run in their bearings before being sent out.

Fluted Rolls are ground to accuracy as to their roundness and diameter, a very important characteristic for high speed.

We supply the best Separator in the market and provide all our frames with traveller clearers, lifting thread board device, cut gearing, improved roving traverse motion, heavy tin drums that don't break down, and all other parts that go with a first-class machine.

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Consideration

OF THE

Northrop . . Loom

Involves comparison with former similar innovations.

It is more expensive — yes, and so is the plain power loom more costly than the hand loom which it displaced.

Why not return to hand looms and get a cheap equipment also giving more laborers employment? The conservative should be more consistent.

Why do mills that have adopted our High Speed Spindles hesitate about using this loom? It will save them more than the entire cost of the spinning on which our spindles only gained a fraction.

If Revolving Flat Cards can be introduced in spite of their greater cost, our looms should follow or preceed them. We can show more profit to the user than the entire cost of Carding, including Drawing and Roving Machinery, with the Picker Room thrown in.

THESE ASSERTIONS ARE CAPABLE OF PROOF FROM THE RECORDS OF 20,000 LOOMS.

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Revolving Flat Carding Engines,
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Looms,

Railway Heads,
Drawing Frames,
Reels,
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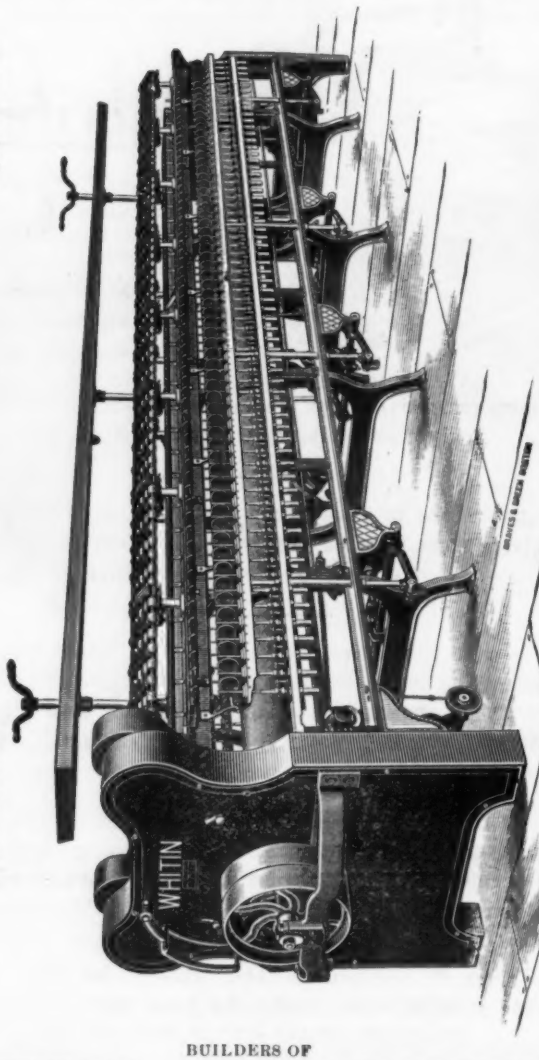

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"Just as Good,"

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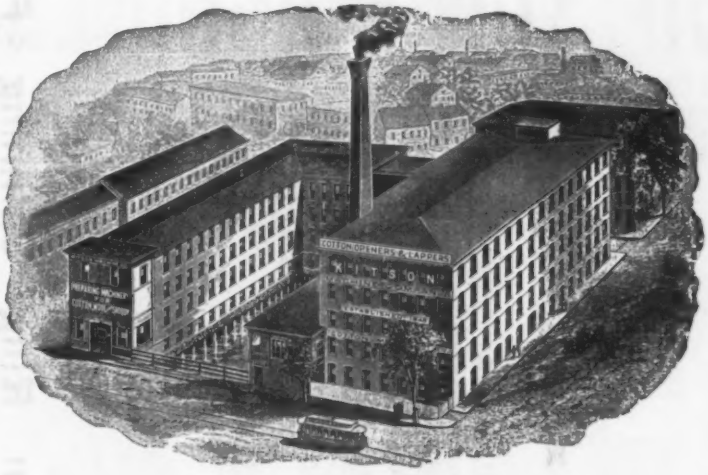

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are always the

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MASON MACHINE WORKS,

TAUNTON, MASS.

COTTON MACHINERY

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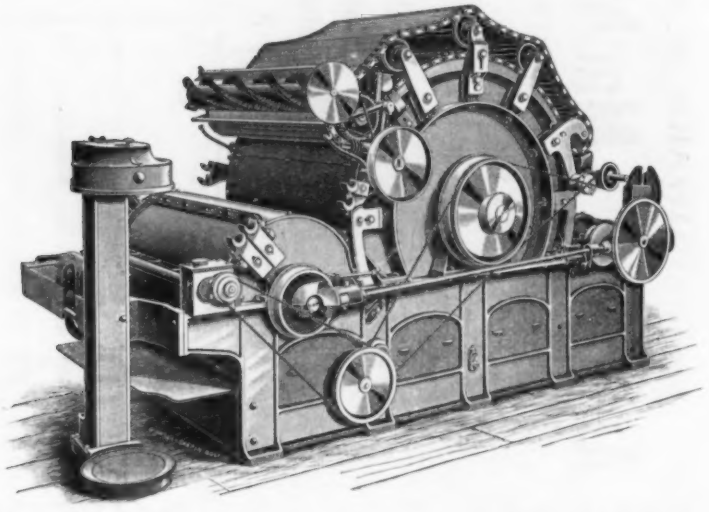

Cards, Combers, Railway Heads, Drawing Frames, Spinning Frames, Mules and Looms,

INCLUDING THE

Mason-Northrop Loom.

SOUTHERN AGENCY:

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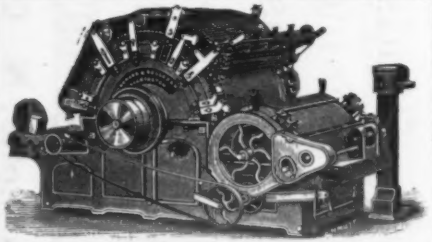

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American Machine Company,

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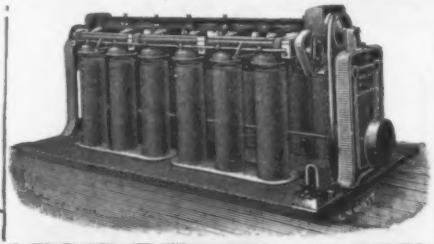
Revolving Flat Cards.

The Simplest and Most Accurate. Greatest Production. Best Quality. Least Waste.

Electric Stop-Motion Drawing.

The quality of the sliver produced cannot be surpassed. Waste, "single" and roller laps are prevented, production increased, and great saving effected.



Bale Breakers, Feeders,
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All made from entirely new patterns and containing many valuable patented improvements.

Slubbing, Intermediate, and Roving Machines.

New patented Differential motion, New Arrangement of Cone Drums, New System of Balancing top or bobbin rail, etc.

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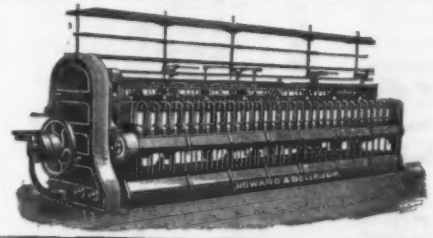

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for WOOL, SHODDY, and COTTON, is

Second to None

on the market. It holds more stock, requires less space, and needs no "attachments."

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Spinners of Worsted Yarns. Mixes and Fast Colors Specialties.
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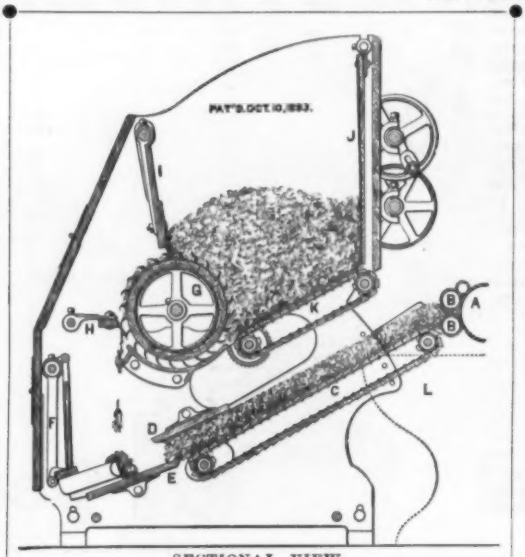

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THE FISHER CARD FEED is simple in construction, is strongly built, turns out even work, requires little changing, and feeds the same whether full or nearly empty.
It is built in all sizes and guaranteed as represented.

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C. T. Crocker, Pres. C. B. Smith, Treas.

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Builders of every variety of

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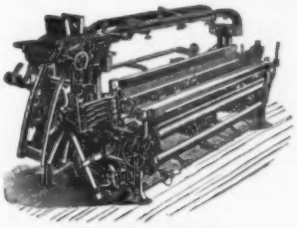
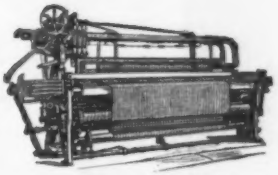
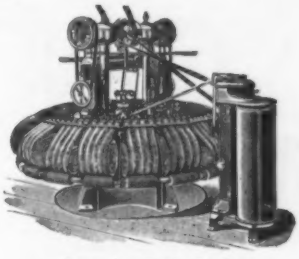


Crompton "1896" Woolen and Worsted Loom.



Knowles Heavy Worsted Loom.

Wool



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Crompton-Noble Comb.

For Combing

COARSE
MEDIUM
FINE

WOOLS.

CROMPTON & KNOWLES LOOM WORKS,

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THE LATEST AND BEST

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BODY—Vulcanized Fibre. **SIDE SEAM**—Riveted with Patent Clinched Rivets. **RINGS**—Tinned Steel, Brazed Joints, Curled Edges. **BOTTOM**—IXXX. Tin Star Corrugation: Fastened without the use of nails or screws, will not crack, warp or shrink and cannot come out. **FINISH**—Coated inside and out with moisture proof coating, handsome and smooth. **WEIGHT**—About one half pound per inch diameter. **SIZE**—All cans to an exact size, perfectly round and true. **DURABILITY**—Superior to any other Can.

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Also Shafting, Hangers, Pulleys and other appurtenances for the TRANSMISSION OF POWER.

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BREASTS, BURRING MACHINES,
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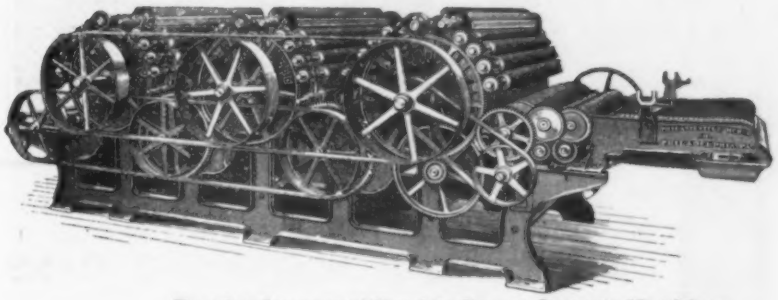

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CYCLONE DRYERS

WOOL
COTTON STOCK
YARN
UNDERWEAR
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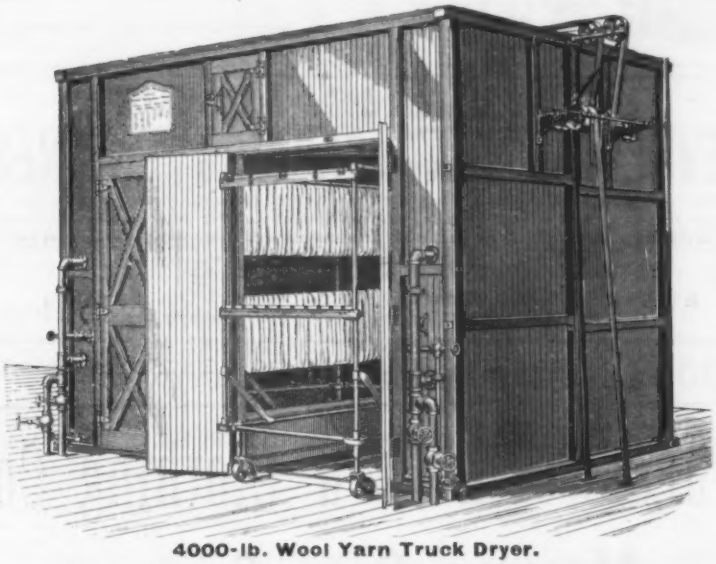

4000-lb. Wool Yarn Truck Dryer.

PHILADELPHIA TEXTILE MACHINERY CO.,

Hancock and Somerset Sts.,

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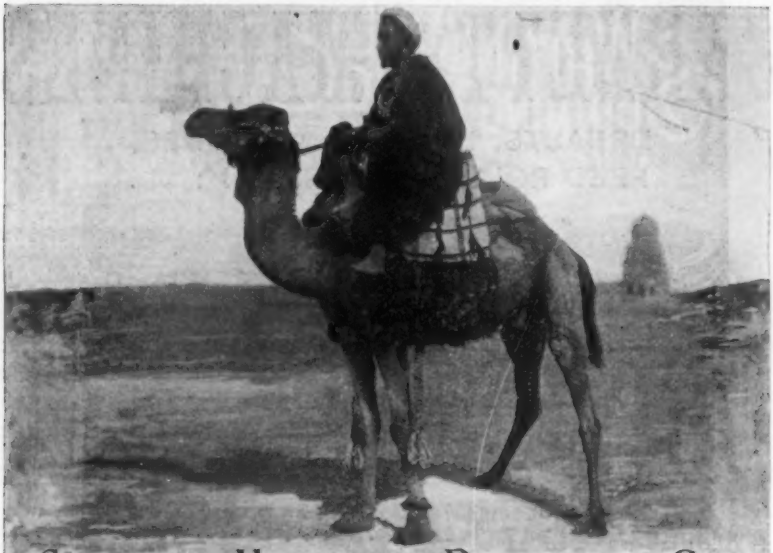

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"1894" pattern with Patent Flexible Bend with slots for direct setting of the flats to the cylinder by the gauge, and McConnell & Higginson's Patent Grinding Apparatus for grinding the flats from their working surfaces.
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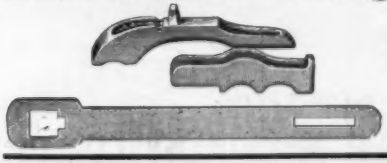

The weight can be taken off and put on to the middle rolls, without stopping your frames, when long staple cotton is used.
The Stirrup is always in place.
No bent stirrup resting on rolls
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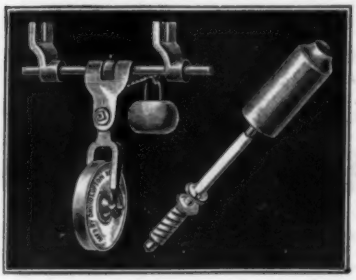

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This clock is adapted to six or twelve stations and the keys are all different. A liberal allowance made for old detectors. For circulars, prices and further information address,

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FOR
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Roving Spindles and Flyers a Specialty.
Light Forgings. Repairing of all kinds.

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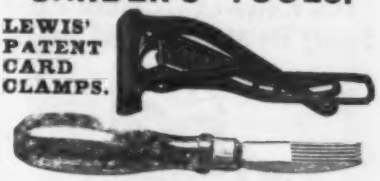
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Elmer, Salem Co., N. J.

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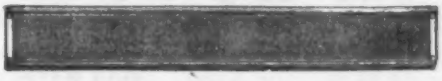
Reeds and Harness,
Manufactured by

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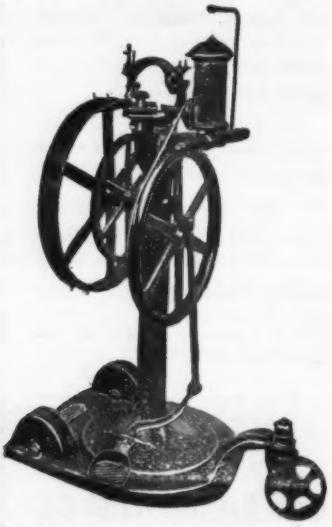

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Safe, Durable and Cheaper.
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Agents for Wm. White Wool Scouring Machines and Atlas Burr Pickers.
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List of Textile Patents.

Issued December 21 and 28, 1897, January 4 and 11, 1898.

Specifications and drawings furnished for ten cents each. Address W. S. Gavey, P. O. Box 222, Brooklyn, N. Y.

Card Grinding Apparatus. 597,365 Joseph Rothwell, Glasgow, Scotland, and Fred Rothwell, Berry, Eng., assignors to Dobson and Barlow.

Carding Machine. 597,314. Melvin H. Coffin, Whitinsville, Mass., assignor to the Whitin Machine Works, same place.

Carding Machine Attachment. 596,605. John P. Megonigal, Gladwyne, Pa., assignor of one-half to Chas. J. Fryer.

Cloth Cutting Machine. 596,738. Goswin Castle, Rome, N. Y.

Combing Machine (Wool). 597,361. Edward Lodge, Lymansville, R. I., assignor of one half to Walter H. Hersey, Providence, R. I.

Dye, Brown Sulfureted. 596,559. Arthur Weinberg, Frankfort-on-the-Main, Germany.

Dye Rhodol. 596,333. Carl O. Muller, Basle, Switzerland, assignor to the Basle Chemical Wks., Bindschedler, same place.

Fibre Cleansing Apparatus. 596,199 Sam'l B. Allison, New Orleans, La.

Gin-Saw Sharpening and Gumming machine. 596,462. John J. Smith. McDonough, Ga., assignor of one half to Paul Turner same place.

Heddle 597,149. Louis Knecht, Philadelphia, Pa.

Knit Fabrics, Apparatus for Finishing 595,893. Paul Schlossman, Philadelphia, Pa.

Knitting Machine. 595,898. George W. Cummings, Cohoes, N. Y.

Knitting Machine (Circular). 595,889. John B. Paxton and Ellis I. O'Neill, Philadelphia, Pa.

Knitting Machine (Circular). 597,288. Willis A. Ingalls and Theodore S. Baron, Brooklyn, N. Y., assignors to Baron, Straus & Co., same place.

Knitting Machine. 597,692. Geo. F. Sturgess, Leicester, England.

Knitting Machine. 596,299. Peter O. Johnson, Rockford, Ill.

Knitting Machine. 596,301. George A. Leighton and John H. Rice, Manchester, N. H.

Knitting Machine Narrowing and widening Mechanism (Circular). 596,933. Joseph A. Burleigh, Laconia, N. H., assignor to the Providence Ktg. Machine Co., Providence, R. I.

Knitting Machine. 595,770. Geo. E. Frink, Pawtucket R. I., assignor to E. Jenckes Mfg. Co., same place.

Lace, Ribbon or Belt Reel. 596,988. James A. Dowdy, Clarksville, Ark.

Mercerizing. 596,464. Carl Tubbe, Augsburg, Germany, assignor to the Farbwerke, vormals Meister, Lucius & Bruning, Hochst-on-the-Main, Germany.

Oil and Reagent Used Therein, Purification of Cotton-seed. 596,411. Orazio Lugo, New York city, assignor to the Oraler Mfg. Co., Camden, N. J.

Seed Delinter (Cotton). 597,123. John S. Rosamond, Memphis, Tenn., assignor to the Continental Cotton Seed Co., same place.

Seed Delinter (Cotton). 597,124. John S. Rosamond, Memphis, Tenn., assignor to the Continental Cotton Seed Co., same place.

Seed Delinting Machine (Cotton). 597,327. Wm. A Ragsdale. Greenville, Mass., assignor of one-half to Olive A. Pollock, same place.

Seed Delinting Machine (Cotton). 597,125. Frank E. Rosamond, Memphis, Tenn., assignor to the Continental Cotton Seed Co., same place.

Spindle Bearing. 595,903. Edgar J. Carroll, Worcester, Mass., assignor to the Sawyer Spindle Co., Portland, Me.

Spinning Machine. 596,106. Joseph Fossel, Boston, Mass.

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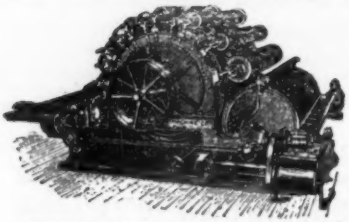

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Spinning-Machine Ring. 596,016. Abram W. Harris, Providence, R. I.

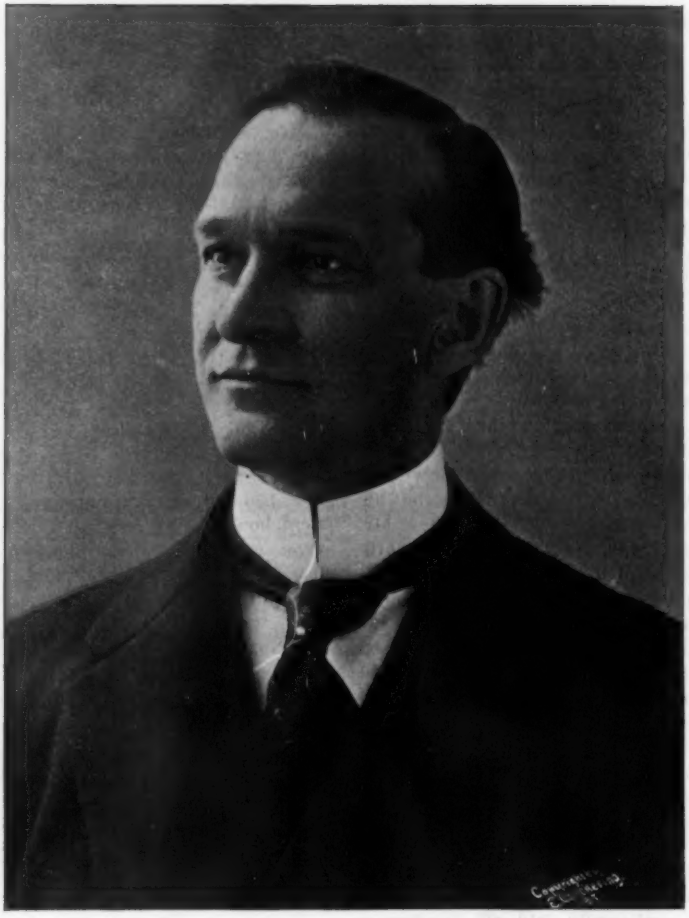
Spinning-mule Driving Mechanism. 597,234. Joseph A. Aubry, Battenburg, Germany.

Spooling-Machine, Weft-thread. 596,794. Jean Schweiter, Horgen Switz.

Tentering-Machine Clip. 597,162. Frederick I. Dana, Providence R I., assignor to the Thos. Phillips Co., same place

Warping-Machine Registering Mechanism. 595,907. Russell W. Eaton, Brunswick, Me., assignor to the Draper Co., Portland, Me., and Hopedale, Mass.

Woven Textile Fabric. 296,267. Carl F. Honsch and George Corbion, Jr., Philadelphia, Pa., assignors to said Corbion, Jr.



WILLIAM B. PLUNKETT.

TEXTILE WORLD.

Vol. XIV. FEBRUARY, 1898. No. 2.

WILLIAM B. PLUNKETT.

William B. Plunkett was born in Adams, Mass., April 2, 1850. He received his education in the public schools of his native town and at Munro Collegiate Institute, Elbridge, N. Y. In 1871 he became a partner in the then well-known firm of Plunkett & Wheeler, cotton warp manufacturers, composed of his father, the late Gen. Wm. C. Plunkett, and his uncle, the late Daniel D. Wheeler. After the death of Mr. Wheeler the firm was merged in that of W. C. Plunkett & Sons, and as such is still continued, the partnership now consisting of Wm. B. Plunkett and his brother Charles T. Plunkett. Mr. Plunkett has always been prominently identified with the advancement and prosperity of Adams, in which he is a "conspicuous figure," made so by his devotion to all its material interests; his unvaried courtesy, kindness and liberality; as well as by his tall and commanding physique.

Notably among his many benefactions was the recent giving, jointly with his brother, the use of Forest Park as a pleasure ground for the benefit of the town's people. The park comprises a large tract of land situated near the centre of the town. It is artistically laid out in groves, lawns, drives, walks, with rustic arbors and seats perched on rocks or nestled in ravines. There is a fine bicycle track. It has a magnificent pavillion especially adapted to public gatherngs, picnic parties, socials and dancing assemblies. The enjoyment of those who throng its walks and drives on summer afternoons affords ample compensation to the generous donors.

Mr. Plunkett is treasurer of the Greylock mills at North Adams, a plant with 25,000 spindles; also of the Berkshire Cotton Manufacturing Co., of Adams, which has 155,000 spindles and is one of the largest and wealthiest of New England corporations. He is president of the Greylock National Bank of Adams, a director in the Berkshire Mutual Life Insurance Co., and the Berkshire Mutual Fire Insurance Co., of Pittsfield, and in other prominent corporations and institutions; also president of the Home Market Club, Boston. Mr. Plunkett has declined rather than sought political honors. He is, however, a fine type of stalwart Republicanism and has contributed freely of mind, heart and purse to party success.

He was a delegate to the Republican National Convention at Minneapolis in 1892. During the last presidential campaign he was in close touch with the Republican National Committee, and rendered valiant service to his party. He has the proud distinction of enjoying the friendship and confidence of President McKinley in a marked degree, and between the two families there exists the most cordial and happy relations.

In 1897 Mr. Plunkett was appointed a member of the Government Board of Visitors at West Point. At the recent State election he was elected a member of the Executive Council, a position for which he is eminently qualified, receiving from his own town the magnificent endorsement of the largest majority on the ticket.

The qualities of mind and character that endear Mr. Plunkett to his fellow townsmen and friends generally

may all be summed up in the words "He is a man." The attributes of a sterling manhood are seen in him in their noblest and best development.

He is an honored and useful member of the First Congregational church of Adams, and the beloved superintendent of one of the largest Sunday schools of that denomination in the State. He justly esteems this position his highest honor, more to him than fame or wealth, and one to which all others are subordinate.

As a citizen, Mr. Plunkett is liberal minded and large hearted. As a man of affairs and extensive business interests, he has rare executive ability and a high sense of accuracy and order. He is an exceptionally ready and capable man. He puts his best into whatever he does.

Southern Competition.

BY A NORTHERN COTTON MILL AGENT.

The cotton manufacturing industry, here in the North, is in a poor business condition, and, looking at it from a manufacturer's standpoint, I do not see anything very encouraging in the future. In the first place I think there are too many spindles and looms to ever again make it as profitable here, at the North, as it has been. There must be, if the mills run to their maximum, always an overproduction.

It may be considered, how can we manufacture as cheap as the cheapest, so as to be equal competitors in the market? There are three ways to do this: (a) make the machinery produce more pounds; (b) run the machinery longer hours; (c) pay less wages. Or these three combined in a moderate way would produce the same results.

I said some five years ago, that the Southern mills on coarse work were doing just as good work, and as much of it, as the mills at the North, on the same class of goods, and that they only lacked one thing to do as well on fine work, viz., skilled labor, and they were fast creating that. Time has proved the correctness of the statement, and Northern manufacturers have waked up to a full and complete realization that they have, within one day and night's ride of their mills, competitors of no mean proportions.

I make the prediction, that inside of ten years the Southern mills will make the very finest fabrics. And it is no marvel, when we stop to think of the Northern capital, brains and muscle that have gone to the cotton fields and put the spindles and looms along side of the gin. Northern corporations are investing their surplus in cotton mill plants in the South. Note the Nashua and Jackson mills, of Nashua, N. H., the Massachusetts Mills, of Lowell; the Dwight Mfg. Co., of Chicopee, and others.

I have made two trips South during the past year, and visited some of the best, and some of the oldest cotton mills there, running on white and colored goods. I found there 66 and 68 hours against 58 and 60 here; wages 25 to 40 per cent. less; fuel 30 to 75 per cent. less; no freighting of hoops, sacks and sand 800 to 1,000 miles. Most every mill, except in the large towns or cities, runs a company store at a profit of 30 to 50 per cent.

Is it any wonder these mills can run days, and many of them nights, and pay 10, 20 and even 30 per cent. dividends? while the mills at the North are run at cost, or very small profits, and many at a dead loss.

I had the opportunity to see the cost sheet of one mill, for a six months' period. This mill was on about one-third colored work, and the total labor cost, including the superintendent and office help, in fact every hand about the plant that received any pay whatever, except the treasurer, was under three cents per pound. Yarn ran from 8's to 28's, average about 17, very large proportion 16's warp and 20's filling. With cotton put into the picker at one-half cent per pound less than can possibly be done at the North, and averaging one grade higher than here, what can be expected of such a competition?

For two years we have been anxiously waiting and watching for the revival of the cottn mill industry, and while doing so, the spindles and looms have increased in the South to such an extent that we are still on the anxious

seat, with no very bright prospect in view.

In order to meet the Southern mills in the market, we shall have to bring the cost of manufacture to a corresponding level; and while some mills here at the North, which have the best of machinery, running at the highest possible speed, may be near it, others not so well equipped have got to reduce some other way. Fall River manufacturers have taken the bull by the horns, and propose to reduce wages. This may be wise, and it may not. Those on the premises are better able to judge, but I do not see any other way for them to do. Fall River mills have been running for years at the highest possible rate of speed and to attempt to gain anything in that direction now, would be suicidal, and I should not be surprised if other cottop mills in the North were obliged to follow the same line inside of one year.

I have said that the Southern mills get their cotton one-half cent per pound less than we do, and that it averages one grade higher. Some may wonder how this can be done. I was told by a mill treasurer in the South, that he bought nothing higher than middlings for his mill. The next day he took me into his mill, and when we went into the picker room, they were opening cotton. I looked it over carefully, and then said to him, "Mr. Blank, I thought you told me yesterday that you bought nothing higher than middlings. "I do not" he said. "Well," I remarked, "you have a very nice looking pile of good middling cotton there now." As I was going out with him the next day, while he was to buy some cotton, I thought best to say no more, but watch events, and as I saw him and his cotton man buy 42 bales that day, from 8 or 10 different farmers, I soon saw how he bought his middling cotton. If a Southern mill man is running a store, selling supplies to a small farmer, taking a mortgage on his crop, when that crop is brought in, the grade of cotton is never above what it really is, I assure you. If a farmer, raising 6, 8 or 10 bales of cotton, is free to sell where he chooses, he hauls it several miles to the mill or factory, where he has little or nothing to say about the grade, as it is fixed by the buyer.

I wish to touch one other problem that has got to be faced in a very few years, that is, colored help in the cotton mills South. This will come as sure as day succeeds night, and while it may hurt us still more at first, it is the only bright spot I see in the Southern cotton manufacturing situation. I say bright spot, because colored help will work for so much less wages than the Southern whites, that the whites will organize and give the manufacturers trouble wherever they are employed. I see no reason why colored help cannot be in all departments in the mills South. If we can take the people from all lands in our Northern mills and teach them to do our work,—card, spin and weave, why cannot an equally intelligent colored person be utilized? This is a problem that has got to be faced, and if it does not cause the trouble above mentioned, it is going to still further undermine our cotton mill industries, and what are we going to do about it?

Manufacture of Mixed or Party-colored Fabrics.

A recent German invention claims certain improvements in the manufacture of mixed or party-colored fabrics.

The invention is apparently applicable to fabrics of any description—such as those made of wool, cotton, silk, or mohair, or mixtures thereof, for example—whether bleached, dyed or been subjected to other preparatory processes—such as pile cutting or shearing, singeing, steaming, washing, fulling, treating with chlorin, or the like—or whether the fabrics be woven from plain or from colored threads. Either upon one side or upon both sides of the fabric, either dyestuffs or mordants, or both dyestuffs and mordants are applied by means of an impressing or printing operation, which may be done by any well-known device,—such, for instance, as pressure rollers or blocks, or the like. In impressing or printing the fabrics, one design or a number of designs may be

employed, which, however, should be as little pronounced or marked as possible, they preferably consisting of minute dots, streaks, or similar irregularly-disposed groundwork. The same design may be applied in the same or different colors to both sides of the fabric, or a different design may be used for each side if both sides are to be treated. Between the lines or figures of the design so impressed or printed, the original color of the fabric should remain conspicuously visible. The desired graduations of shades are obtained either by diluting the coloring-matter or by more or less deeply engraving the design on the roller or printing-plate. Fast colors only should be used, and they should be carefully "fixed" or "ingrained," which can be done by steaming. This process must be carried out very slowly and extended over a somewhat long period, so that the colors may not be damaged by the subsequent treatment to which the fabric is submitted. This is very essential, as up to the present time where animal fibre has been printed upon, the pieces under treatment have been found incapable of even resisting mere washing for any length of time.

The next stage of the process consists in altering the relative positions of the component fibres of the fabric, which can be effected by turning or twisting them around or partly around, so as to efface or tone down the sharp edges of the impressed or printed design, and thereby to impart to the fabric, the appearance of a fabric woven from fibres of different colors or from party-colored fibres. This object may be attained either by energetic and long-continued washing in a washing-machine fitted with pressing or squeezing rollers, or, in order to enhance the effect, the same process may be performed in a fulling-machine, or by a combination of two or more of these operations, or by other manipulation which will attain the object in view.

—The Manchester Exchange is the great meeting place, in Lancashire, for the representatives of cotton industries and kindred ones.

Silk Gloss on Cotton.

According to a French patent, silk gloss may be imparted without tension, if the fabric be first saturated with caustic soda 76° Tw., and the excess of fluid having been removed in a hydro-extractor, dried at a temperature of 86°-104° F., whilst on a stenter, it may thereafter be worked without special precautions. It is also said that satisfactory results are got by stentering the fabric, whilst still moist with caustic soda, beyond its original dimensions, and then washing it without tension, a margin being thus given for shrinkage. Instead of using caustic soda of 71° Tw., as customary, it has been found that fabrics can be effectively mercerized with a lye of 15° to 32° Tw., if, after saturation, they are exposed to a temperature below freezing point. If the material is during that time kept in a state of tension, and then restored to ordinary temperature, it may be released from such tension and washed without shrinkage taking place, whilst a permanent silk gloss is attained. The economy and convenience of this process are obvious. It is proposed in order to avoid shrinkage under the action of alkali, while securing the desired finish, to add certain substances to the mercerizing medium. Thus a French company employ a mixture of 200 parts of a 20 per cent. caustic, with 50 parts of ether; with this the fabric is impregnated in any convenient manner, and then steamed a short time. The shrinkage is limited to 4 per cent., as against 25 per cent. without ether. In any case the medium employed is a very expensive one, and might well be replaced by some such substance as glycerine, which has been known for some time to prevent contraction.

—Sateens are largely used in the production of worsted and woolen cloths, and they form an important variety of crossings.

—The practice of saturating the fleeces of long-wooled sheep with oil and coloring the tops for show purposes has been severely condemned by the judges at recent Australian shows.

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An Illustrated Monthly Magazine representing the Textile Industries of the United States.

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Proprietors and Publishers.

HENRY G. KITTREDGE, Editor.

PUBLICATION AND HEAD OFFICES:

BOSTON: - 620 ATLANTIC AVE.

PHILADELPHIA OFFICE,
THE BOURSE.
EDWARD S. KENDRICK, Manager.

NEW YORK OFFICE,
140 Nassau Street.
A. H. TYLER.

Subscription Price.

$2.00 per year for U. S. and Canada.
2.50 per year for Foreign Countries.
3.00 per year with Dyer's Supplement.
(Postage is prepaid by publisher.)

Remit by Express Money Order, Draft, Post Office Order or Registered Letter.

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Special quarterly issues are published in January, April, July and October; one (January) being a statistical issue, and the others devoted especially to the cotton, knitting and woolen branches, respectively.

LABOR LEGISLATION.

There are a number of bills before the Massachusetts legislature affecting the employment of labor. There is one bill accompanying a petition that was presented last year for the limitation of the hours of labor in manufacturing or mechanical establishments, to 54 hours a day. The first hearing on this has already been had. It is simply an amendment to reduce the working hours from 58 to 54. There is another bill, limiting the employment of women and minors, under eighteen years of age, in mercantile establishments, to within 60 hours in any one week, in cities of 50,000 inhabitants, or more. There has been no date set for a hearing on this bill. There is a bill, on which a hearing has already been had, to prohibit deductions in the wages of women and minors employed in mechanical establishments, who are paid by the day or hour, for the time during which the machinery is stopped, provided these people are confined in said establishments. There is another bill to repeal the statute authorizing over time employment of women and minors, to make up for time lost in consequence of the stopping of machinery. A bill has been introduced against the use of any but plain window glass in factories. This is aimed at the use of opaque, ground or corrugated glass, that cuts off the view of what is outside from persons within.

WOOL VOTES.

In our January issue, we had something to say regarding the withholding of votes in the House of Representatives, on the pasage of the wool tariff. We submitted several questions, which were suggested by the following statistics which we have compiled, showing the vote on the passage of the several tariff acts in the House of Representatives for 1890, 1894 and 1897. These statistics make an interesting presentation of facts which Judge William Lawrence has, in a measure, attempted to justify, in a communication to be found elsewhere in this magazine. The figures tell a

story of their own, notwithstanding they need some explanation. The members of the House of Representatives who voted upon the passage of the 1897 act were elected upon the two issues of free coinage of silver and the tariff, and it must be assumed that the 327 votes that were cast, fairly represented the sentiments of the country, not only upon the tariff as a whole, but upon its several schedules, as parts of a complete system of customs taxation, with the principles of protection back of it. When 205 votes were cast in the affirmative and 122 in the negative, it must be presumed that that was a fair representation of the sentiments of the people of the country upon that measure unless it can be explained away.

this district. Utah and Wyoming were each represented by a Democrat, who defeated a Republican and a Populist, in his own State. Idaho, Montana and Nevada, each had one representative, Colorado had two, all of whom were present at the time of voting, but did not see fit to exercise their rights in this respect. The representative from Idaho was a Fusionist, and defeated a straight Republican and a silver Republican; the one from Montana was a silver Republican; the one from Nevada a silver Democrat, who defeated a Republican and a Populist; the one from Colorado was a silver Republican and defeated a Republican and a Prohobitionist, and his colleague was a Fusionist, and defeated a Republican.

Vote on the Passage of the Tariff Act — House of Representatives

States	Number of Sheep, 1896	1890		1894		1897	
		Yea	Nay	Yea	Nay	Yea	Nay
1 Ohio, Michigan, Wisconsin, Indiana, Illinois.	6,179,287	42	10	44	34	61	17
2 Minnesota, Iowa, Missouri, Kansas, Nebraska, North and South Dakota	2,818,408	27	4	24	25	26	13
3 Montana, New Mexico, Utah, Wyoming, Colorado, Idaho, Arizona, Nevada ...	12,251,295	2		3	2	Utah, Wyoming	2
4 California, Oregon, Washington	5,958,357	4		3	8	5	4
5 Texas.	2,911,993		8	13		3	9
6 Elsewhere in the United States ...	6,345,065	77	59	117	71	110	77
Total in the United States	36,464,405	152	81	204	140	205	122

Act of 1897 Present and not Voting ..... Idaho Montana, Nevada, Colorado.
" " " Absent . .(Delegates) . . . . . New Mexico, Arizona.
" " " Group 1. All voted — Group 2. 10 present and not voting, 1 absent.
" " " Group 4. 2 present and not voting, 1 absent — Group 5. 1 absent.

The most interesting part of this statistical presentation is the votes of the representatives from the region which has one-third of the sheep in the United States, viz., Montana, New Mexico, Utah, etc. The number of votes to which this region was entitled was seven. New Mexico and Arizona were not entitled to votes, as they were represented by delegates only. There were only two votes cast from that section, one by Utah and one by Wyoming. These two were thrown against the bill, so that the tariff received no support at all in the votes of the representatives from that region. The reason for this singular state of affairs may be explained in the political character of those representing

The fact, however, stands out prominently and significantly, that the wool growers of the middle region west of the Mississippi, subordinated their interests to other considerations than those bearing on the protection of wool. Figures indicate that they were indifferent to a customs duty on their commodity.

CAUSES OF PROSPERITY.

When President McKinley said, at the recent meeting of the National Association of Manufacturers, in New York. "That while national policies can encourage industry and commerce, it remains for the people to project and carry them on," he spoke a truism

which many fail to recognize when they refer to the beneficial effects of a customs tariff upon the industries of this country. A tariff on foreign commodities cannot, of itself, make any business prosperous; the only object or effect that a tariff can have upon our industries is to give them the home market, but the latter must depend for its prosperity upon economic conditions which no legislation can materially influence. If the general condition of the people is prosperous, then our manufacturers have the almost exclusive trade that exists. The chief cause of our present prosperity is due to the excellent harvests that have been had in Western States, permitting large exports of cereals at profitable prices to meet a demand abroad due to short crops in other producing countries. Other important factors enter into this favorable situation, but that just mentioned is the most conspicuous one. The conditions are extremely favorable for making the current year one of the most prosperous of any that we have long experienced.

Confidence may be had in the continued improvement of trade and commerce, in the assurance that our financial system will not be changed by any legislation on the part of Congress. President McKinley and the House of Representatives can be safely relied upon to prevent any obnoxious legislation on the part of Congress affecting the standard of our currency by depreciating its value. The national Senate has shown itself to be made up, to an unhappy extent, of political demagogues, with an unenlightened constituency back of them on the question of a national currency. The national honor was tainted by the vote in the Senate on the Teller proposition, that the government pay its bonds in a degraded currency instead of in gold, which is the recognized standard of value throughout all civilized countries. The House of Representatives, by a satisfactory majority, redeemed to some extent this reflection upon the honor and integrity of the nation. The vote in the house, however, clearly demonstrated that the greatest fear is today in the policy and action of the Democratic party.

President McKinley declared in the same speech above alluded to at the banquet of the National Association of Manufacturers, that nothing should or will ever tempt the nation to scale down its sacred debt through a legal technicality, but whatever might be the language of the contract, the United States will discharge all of its obligations in the currency recognized as the best throughout the civilized world at the times of payment. He gave an assurance of the policy of the government most gratifying to all the industries and money interests throughout the country.

COTTON TRADE OF GREAT BRITAIN.

According to Ellison & Company's annual review of the cotton trade for the year 1897, the past year, like its immediate predecessor, was a trying and perplexing period to manufacturers of Great Britain, and also to the importers of the raw material, notwithstanding the fact that the Oldham cotton mills ended the year with a better balance sheet than was expected, and much better than for any year since 1890. Out of the seventy-nine companies in Oldham, seventy-two showed profits amounting to $773,700, and seven showed a loss of $35,080, leaving a net profit of $738,620. The seventy-nine companies, to which the 1897 figures refer, have a paid-up share capital of $16,782,465, and the net profits, as given above, on this amount, is 4.8 per cent., against a little over 1.4 per cent. for 1896, and 1.6 per cent. for 1895. In 1890, the profits were nearly 11 per cent. The years 1892, 1893 and 1894 showed a loss. Taking, however, the past six years, the yearly average profit was only a little over 0.33 per cent.

The statistics show that the cotton industry of Great Britain is not a progressive one at the present time, but is at a stand-still. This is noted not

only in the number of spindles in operation, but in the amount of cotton consumed. The consumption of cotton for 1897 was less than for any year since 1893, and even less than for 1890 or 1891. It may be stated that the consumption has been stationary for the last decade. Within this time, the consumption of cotton on the Continent and in the United States has been on the increase, showing an improvement of about 45 per cent. among the Continental mills, and about 33 per cent. among those in the United States. The annual consumption of cotton in the world is estimated at about 11,335,000 bales of about 500 pounds each.

Over 80 per cent. of the yarn produced in Great Britain is exported in the form of either goods or yarn. The larger portion of the exports of goods goes to East India, while the larger portion of the yarn exports goes to European countries. Great Britain's trade with European countries, in cotton yarn, has remained comparatively good for more than half a century, while in piece goods, nearly all has been lost.

THE WOOLEN INDUSTRY OF GREAT BRITAIN.

While the woolen industry of the United States has been peculiarly prosperous for the last nine months or more, that of Great Britain has been greatly depressed, due chiefly to the loss of the American market since the present tariff went into operation. This state of affairs makes up the principal part of the annual review of the Bradford trade, published by the "Observer," of that place. In anticipation of higher rates of duty on imported fabrics into the United States, the American demand for woolen goods from Bradford manufacturers was in excess of immediate wants, for shipment prior to the passage of the tariff bill. This is brought out very clearly in the report from the United States consulate, Bradford, which shows that in 1897 the exports from that consular district to the United States amounted to nearly $24,500,000, against $13,700,000 in 1896. Nearly 82 per cent. of the exports to this country, in 1897, consisted of the following, placed in the order of their value: wool, stuff goods, worsted coatings, cotton goods and tops. The period of greatest exportation was the three months preceding the approval of the tariff act.

One, if not the greatest, evil that the textile and other industries of Europe have to contend with, is the great waste of money and energy that is expended in sustaining immense standing armies, and thus taking out of useful occupation a large population of physically capable men who should be engaged in some productive employment.

THE SILK INDUSTRY.

The imports of silk manufactures at the port of New York, last month, were a third more, in value, than for January, 1897. This is a fair indication of an increased demand that has been going on for silk fabrics. The value of imports of manufactures of silk for 1897, was about double the value of those of 1896. Quite as important, however, if not more so, as affecting our domestic manufactures, are the imports of the raw material, or unmanufactured silk, consisting chiefly of that reeled from the cocoon. About the same value of raw silk was imported during 1897, as that of the manufactured article. The probable value of the silk manufacture in this country is $120,000,000, to which may be added the imports of 1897, valued at $25,000,000, making the total consumption in this country, of silk manufactures, at $145,000,000. As will be seen, about 17 per cent. of the domestic consumption consists of imported goods.

IMPROVEMENT IN BUSINESS.

There is every evidence of a continued improvement in business throughout the country in all industries, with the apparent exception of the cotton industry, which is now passing through a period of depression due, to a very considerable extent, to the de-

cline in the price of the raw material during the last twelve months. New England cotton mills are suffering somewhat from Southern competition, but their greatest trouble lies in the fact of the decline in the price of cotton. This depression affects, more or less, all lines of business, which depend upon the consuming power of the work people who are temporarily thrown out of employment or whose earnings have been curtailed.

Clearing house statistics for the month of January, show a remarkable gain for the better, having been 36.3 per cent. larger than for the same month a year ago, and 7.1 per cent. larger than in 1892. The failures throughout the country were notably small for January; smaller than in any previous year of which there is a record. The woolen industry was particularly clear of failures. Our foreign trade is on an excellent basis, showing a favorable balance for the United States. Woolen goods have advanced in price since the beginning of the year, though in some instances we hear of cuts in certain lines of fabrics. This increase was a matter of necessity, due to the advance in the price of the raw material. Woolen manufactures have now reached a point where they will be obliged to advance the price of their products more on a parity with the cost of wool, as they will soon be out of stock that was bought at low figures prior to the passage of the present tariff law.

	Persons employed.		Hours of Labor per week.	Wages Paid.		Per cent. Business done.
	1896.	1897.		1896.	1897.	
Cotton Goods.....	5,983	5,756	54	$ 2,091,611	$ 1,843,159	83
Cotton Mills.....	6,226	6,367	58	1,878,379	1,731,727	80
Hosiery and Knit Goods.....	2,819	2,528	54	1,036,710	817,419	70
Silk.....	3,803	3,987	57	1,419,419	1,359,632	69
Woolen	5,958	6,187	56	2,134,510	1,858,132	69
All industries.. ...	88,934	87,907	56	40,404,002	36,271,729	74

CONNECTICUT INDUSTRIES.

The annual statistics of the Connecticut Bureau of Labor, for 1897, contain some things of interest to the textile industry, which we have gathered together and tabulated. These statistics relate to the year ending with June 30, 1897. So far as the working time of that year is concerned, it appears that the average employment of fifty-four hours a week answered all of the purposes of the cotton goods and knit goods industries, and that if the running time of manufacturing establishments in general, had been limited by law to fifty-six hours a week, it would have answered all of the conditions existing in that year. None of the industries we mention, and this is as applicable to all other industries, was as prosperous for the year ending June 30, 1897, as for the previous twelve months; assuming that the amount of wages paid, and the number of persons employed, is a fair criterion. The percentages referring to the business done is instructive.

MILL TAXATION.

A recent request for the abatement of taxes, made by a Lowell cotton corporation, upon the assessors of that city, brings out some interesting facts concerning the valuation of mill machinery. It appears that the board of assessors have based valuations upon a judicial decree, reckoning all mill properties on the basis of marking off five per cent., or more, per year on machinery generally. New machinery when substituted for old, is marked off thirty per cent. at the start; on buildings, 2 1-2 per cent. is charged off each year. The rebate desired by the Lowell corporation would place its plant on a basis of about $8 per spindle, or a little more than one-half the ordinary valuation

of this and other manufacturing plants. This is taken to be in conformity with the laws of the State, requiring all property to be assessed according to its fair cash value.

A BOYS' CLUB.

There has just been opened, elegant quarters in Fall River, for boys in needy circumstances, as a philanthropic act on the part of M. C. D. Borden, the well-known cotton manufacturer of that city, to elevate the character of the youth who are without desirable home surroundings, so that they may become good citizens. This is the outcome of a gift made by Mr. Borden about eight years ago, as a contribution to the charities of Fall River. The beginning of the club was in a small and cheap building, as the object was largely experimental, and required time to show that it was appreciated and capable of being carried out. The new club building cost $60,000, and is an architectural ornament to the city. The kind of boys that it is desired to attract to this new home, so to speak, are those usually denominated as bad boys. No matter what the character of the boy may be, he is welcomed to the club, and efforts are immediately begun to guide him in the paths which he should go. The membership of the club is now about 1800, and the attendance in the aggregate, last year, was nearly 40,000. According to the register of the club, one out of seven are fatherless, one out of eleven motherless, and one out of every twenty an orphan. The boys come largely from the laboring class. No distinction is made as to color, creed or race, and no religious topics are allowed to be brought up or discussed. The purpose is to improve the moral and physical welfare of the boys. In order to make the place attractive, healthy amusements are given, without temptation or evil surroundings. No cigarette smoking, profanity, or anything that will militate against the morals of the youth are permitted. A penny savings bank is one of the features of the club; deposits from one cent upward being received, until the amount reaches $5, when the depositor is expected to transfer it to one of the city savings banks and take a book therefrom. The boys are allowed to draw against their deposits as they may desire. The scheme is a most excellent one, and suggestive of what might be done in other manufacturing communities.

—In reviewing the statistics relating to the registered students at the Lowell Textile School, for the year 1897-98, just published, it appears that the total number is 254, over seventy per cent of which are evening students. Among the day students, the larger portion are graduates of universities, schools of technology, and high schools. In the list of students, arranged according to occupation, there are assistant superintendents, bookkeepers, dyers, machinists, section hands, spinners, weavers, and others. The greater number of students, of course, are residents of Massachusetts, though there are some from the South and West.

THE COTTON BALE.

The proper baling of cotton has, as long as we can remember, been the subject of complaint, without any evidence of improvement, so far as the square bale is concerned. The greatest advance in this direction has been made in the turning out of a cylindrical bale, against which there is no room for criticism, unless it may be in its form; but, even this has its advantages. It is certainly the neatest bale that has ever been made for American cotton, and there is much promise of its general adoption, not only in this country, but abroad. It needs only the endorsement of spinners. If this can be obtained, its success is assured. The chief point of merit with it is its density, which enables a greater number of pounds to be packed in a given

area, thus lessening the cost of transportation. Its density, also, is largely in its favor, in respect to fire risks. If this density could be accomplished in a bale of a square form, the same meritorious features could be gained. The reason why the cylindrical bale is a better fire risk, is the fact that there is less air in the bale, due to its greater density.

The large compresses in the South are capable of making a square bale with a density fully as great as that to be found in the cylindrical bale. The only reason that this density in the ordinary bale is not maintained is because it is not enforced, and lies in the fact that in placing the hoops on the bale in the compress they are so loosely adjusted that the bale is allowed to regain, to a great extent, its uncompressed size. If the American bale were compressed the same as is done with Egyptian and Indian bales, it would be as good a fire risk as these or the cylindrical bale.

To the spinner, the cylindrical form, or the method of rolling up the bat from the gin, has its merits in the mixing room. When any number of bats can be laid one upon another, as good a blending can be made as it is possible to be obtained. The only thing required would be frameworks and arrangements of inexpensive construction, to accomplish this purpose.

It seems strange that we Americans cannot improve our methods of covering cotton bales. The gunny cloth that is used is the most wretched fabric that it is possible to contrive, and more complaints have been made on this account than anything else.

While upon this subject, we desire to allude to the frequent complaints that are made concerning the gross carelessness on the part of planters and handlers of cotton in the South, in exposing cotton to the inclemencies of the weather, etc. Some of our New England manufacturers are not any less neglectful in this respect than their Southern brethren, as we observed only a few days ago a large lot of cotton piled up in the middle of a mill yard, with a frail structure for a roof, with no protection on the sides to prevent the rain and snow beating against the cotton with all of its injurious effects. It may be reasoned that a commodity worth only six cents a pound is not of sufficient value to go to any great expense to keep in good condition. It cannot, however, be to the advantage of the staple to be thus treated, and its deterioration must be, and is, noticed in the processes of manipulation.

Southern Textile School.

President Hall, of the Technological School, Atlanta, Ga., has been on to the North for the purpose of investigating textile work as it is accomplished in the textile schools at Philadelphia and Lowell. His object was to get as much information on the subject of textile education as possible, in order to make a proper recommendation to the trustees of the Atlanta school for the establishment of a department in textile instruction, towards which the State of Georgia has appropriated $10,000, provided a similar sum is raised by private means, for a purpose of this kind. We understand that plans have already been made for the buildings for the Atlanta Textile School, and the necessary machinery listed; and, in fact, all necessary expenses settled upon. It is proposed to have a course in this school covering a period of three years, and the only requirement to enter will be a thorough knowledge of arithmetic. Where students have completed a regular course at the technological school, they can go through the textile department in two years. The trustees say that there will not be the least trouble in raising the necessary amount of money. The technological school is now in an excellent condition, with 246 students on its roll.

OUR EXPORT TRADE.

It would be well to bear in mind, when dealing with statistics concerning relative exports of cotton goods, that their price is very much lower today than it was a year ago, and, as compared with 1890, nearly 30 per cent

less. Therefore, when it is stated, as was done by Theodore C. Search, in his annual report to the National Association of Manufacturers, that the increase in the exports of cotton cloth is over four million dollars, it means more than this difference, when measured by quantity.

The portion of Mr. Search's report touching upon the importance of technical education and scientific knowledge to be taught in our schools demands attention, though it reflects very largely a well-formed sentiment of the people of this country, engaged in manufacturing enterprises. The future of our industries depends very largely upon the methods that are adopted and the energy that is put in them for the technical training of the youths that are about entering upon a manufacturing career. This is necessitated by the great competition that is going on, not only between different sections of this country, but between our industries and those abroad. Not only have the people of Pennsylvania seen the benefits of technical training, and the people of Massachusetts come to a full realization of its importance, but the value of this kind of training is being keenly felt in Rhode Island, and the governor of that State, in his late annual message to the General Assembly, recommends that the State Board of Education be directed to make a thorough investigation of the subject, and report thereon during the present session. The governor realizes the fact that the time has arrived when the State must take some action in this respect, in order to keep abreast with other communities. He urges the necessity of establishing a textile school, and undoubtedly the result will be that some necessary action in this direction will be taken by the legislature on economic and educational grounds.

COTTON GIN TEST.

A recent cotton gin test has been made by the government, at Cuero, Texas, on cotton grown there from Egyptian seed, furnished by the government. The results are said to have been successful and gratifying. We learn from official sources that experiments of this kind have been going on for several years, under the direction of W. H. Wentworth, in order to see the result of the cultivation of Egyptian seed on American soil, and under American climate. An obstacle to the success of such cultivation in the minds of some, has been the need of a proper gin to separate the seed from the lint—an ordinary, or saw gin proving injurious to the fibre. The gin in question was the same as that used in Egypt. The production of this gin was 70 pounds per hour the first day, and 76.9 pounds per hour the second day. The manufacturer of the gin, however, only claimed a production of 50 pounds per hour. This relatively large production was due, no doubt, to the fact that the mechanical operations were under the charge of an expert, sent by the Department of Agriculture.

The object, evidently, of cultivating Egyptian cotton in this country, is to supplant as nearly as possible the native cotton with an American substitute, the desire being principally to obtain the brown color that is so much in demand to meet the wants of fashion. The length of fibre is also much in favor of this cotton, but there are American varieties that can furnish this quality, without much difficulty, if a proper selection of seed is made from year to year. The cultivation, however, of Egyptian seed in Texas soil, for instance, as we can state from some personal knowledge, has not, on the whole, proved entirely satisfactory, on account of a noticeable retrogradation in the character and length of the fibre. The same is true when Sea Island cotton is attempted to be cultivated.

The gin that was imported for the trial referred to was undoubtedly the roller gin, after the Macarthy pattern, although this is not stated to us; and the production of such a machine will average, under ordinary conditions, about 1000 pounds of lint a day; and the production of only 500 to 770

pounds per day of ten hours, seems to us very small, and militates against the economy of such a machine. A saw gin will turn out in the neighborhood of 5,000 pounds of lint per day. The only thing in favor of any roller gin is that the lint comes out in a much better condition than that turned off by a saw gin. The Egyptian seed being a naked seed, from which the fibre can be easily removed, it comes within the same class as Sea Island cotton, for the ginning of which a roller gin is always used. So far as accounts have reached us, we see nothing in the results of the gin used in these tests, to warrant us to speak in very commendatory terms concerning them.

COTTON SWINDLING.

There has been current of late, accounts of swindling operations on the part of a gang which has been operating in Texas in buying and shipping cotton to foreign consignees, and drawing against it, according to the usual formalities; the cotton, however, turning out to be very much inferior to that represented in the invoice. It appears that these transactions have been going on for the last ten years, and it is very strange, as viewed by an outsider, that anything of this kind should continue for so long a time without being discovered. We doubted the story when we first heard of it, but now know that all that has been reported is essentially correct. Swindling operations of this kind have before occurred, but they have seldom, certainly not within the last eight years, so far as we know, occasioned any financial loss to the cotton mills of this country. In this particular instance, the principal sufferers are certain New York exchange brokers or those they represent. The usual method of shipping cotton to domestic or foreign consignees is a simple one, that of delivering it to some transportation company and obtaining a bill of lading, and drawing a draft against it on the consignee, and obtaining money on it to its full value, from a local bank at point of shipment, which, in turn, forwards the draft with its attachments to its New York correspondent, for example, who sells the draft to some exchange broker, and through this channel reaches the consignee. If the cotton is sent to a mill treasurer at the North, the draft may be forwarded to some bank in Boston, for instance, and then presented to the consignee for acceptance and payment. The method pursued by this gang seemed to be regular, their swindling appearing in the character of the cotton that they shipped, as, for instance, they would invoice middlings and ship linters, the latter worth but a fraction of the value of the former.

It appears that this gang of swindlers operated under various names, and when their methods were found out in one place, they would go to another, without creating any suspicion. It seems strange that they could do this even in Texas. They even sold drafts against parties in Europe, where most of their shipments were consigned, without receiving a purchasing order from the consignees, which resulted in the protest of their drafts, to the loss of the banks that advanced the money on the invoices and bill of lading. The only recourse that the money lenders had was to sell the cotton on arrival, but instead of finding it to be worth $35 to $40 a bale as the case might be, it was not worth more than half that, on account of the grade being lower than was invoiced. The legal prosecution of these swindlers never, until now, has resulted in conviction, although in some instances it has lead to a compromise between the swindler and his victim, by which the latter recovered a small part of his loss. Lately, the United States government has taken the matter up, on the ground of using the United States mails for fraudulent purposes. A case against these swindlers is to come up before the U. S. Grand Jury on the 15th or 20th of this month. It seems that this jury has found a true bill and has indicted eight of the gang, names unknown. The actual trial will come up next autumn.

Votes on the Wool Tariff.

Editor Textile World:

Your editorial in the January number relating to the votes that were cast in the House of Representatives on the wool schedule, has attracted my attention. You allude to only two votes being cast upon the passage of the bill in the House, from the region where one-third of the sheep exist, viz., Montana, New Mexico, Utah, Wyoming, Colorado, Arizona and Nevada, and these two votes (cast by Utah and Wyoming) were thrown against the passage.

The inference you draw from the facts stated, is, I suppose, that the representatives in Congress from those States did not favor a tariff on wool. Precisely the reverse is true. The two votes cast against the bill were by free silver Democrats, "dyed in the wool" Democrats, whose districts cared but little for protection, but cared much for free silver. The representatives who did not vote were also free silver Democrats, but who, knowing that the States they represented favored a wool tariff, did not dare to carry out the full Democratic doctrine of free wool, and so were either absent or dodged. These States elected the Democrats mentioned, not because they loved wool protection less, but because they loved free silver more. In fact they were persuaded of a truth that free silver would give them better protection for wool than Mr. Dingley and too many New England manufacturers were willing to give them in a tariff law. Thus, Theodore Justice, a Republican, who aided largely in securing the present low inadequate rates of duty on wool, in a letter November 8, 1896, referring to the Presidential election of 1896, and vote of woolgrowers, said:

"The woolgrowers were tempted by the proposition that Bryan's election meant a premium of 50 per cent. or more upon gold, which would be equivalent to that much tariff protection as the duties as well as the cost of importing wool would be payable in gold, but they never forgot that Bryan voted for the Wilson bill which destroyed one-third of this great industry and closed one-half of the American woolen mills, and thus destroyed to this extent, the only market the American woolgrower ever had for his wool. On the other hand, McKinley favored not only protection for wool, but under the McKinley (tariff Act of 1890) the factories were running night and day: and enough woolgrowers in these States with free silver leanings voted for McKinley in their struggle for life, to elect him, and his election was due to the McKinley protection which woolgrowers in these close states (California, Kentucky, Oregon, Indiana, West Virginia, and North Dakota) believe in."

The gold premium can not be avaded by perjury and fraudulent bills of lading; as can the Dingley tariff.

The woolgrowers in six Democratic States turned the scale in favor of McKinley for president and saved his election. But for them, Bryan would have been elected. And now I sound the alarm once more. If New England publications, in combination with wool manufacturers, do not aid in giving better protection to woolgrowers, and in removing defects in the present law, I predict, not threaten, but predict, that you will drive enough Republicans over to free silver, with its protective benefit to wool, to secure the election of a free silver president and Congress in 1900 if not a free silver Congress in this year 1898.

WILLIAM LAWRENCE.
President of Nat'l Woolgrower's Association.
Bellefontaine, Ohio.

--There are several large concerns in New England who are doing a big business with China, Mexico and South America.

—In colored work the waste is often much higher than in the ordinary run of grey warping; in fact,, in some mills the percentage of waste allowed for is sometimes as high as 8 per cent., but 5 per cent. may be taken as a reasonable allowance to make.

[*Exclusively Reported for the Textile World.*]

Azo Colors and Some of their Applications.

Paper read by W. P. Atwood, chemist of the Hamilton Manufacturing Co., Lowell Mass., before the Lowell Textile School, January 6, 1898. The paper was illustrated by dyeing experiments and specimens of azo colored goods.

The subject of my talk covers a much wider field than I can attempt to deal with in one evening. I propose, therefore, to take up a small, but important, department of the dyeing of textiles, that has had a great development within a few years, viz: the production of insoluble azo colors on cotton goods.

Azo colors may be roughly divided into two classes, soluble and insoluble. The former, or soluble colors, are produced by the great color manufacturing firms, and put upon the market in this form because it is more convenient to use them in this condition. In this class are found many of the substantive colors, such as the so-called benzo and diamine dyestuffs, now so common. It is not this class, however, that I wish to discuss, but the second, or insoluble azo colors, which may be produced upon the fibre itself, and sometimes, on this account, called "ingrain" colors. Another and more common name is that of "ice colors." The reason for this will be seen later.

I have here a solution of beta naphthol in dilute caustic soda. To this I add a solution of prepared paranitraniline, and a scarlet precipitate immediately forms. This red substance is an azo color and is quite insoluble in acid or alkali, and in consequence of this insolubility would be a fast color if it could be produced on the fibre. This scarlet precipitate could be filtered out and by appropriate treatment converted into a dyestuff of the first class, but this is out of the question for the dyer.

The bright shade of this azo body makes it a desirable color for textiles, and the question then arises, how can it be fixed upon the goods that we wish to color. There are two processes which may be used. One is to use the washed-red precipitate as a pigment, fastening it by the usual albumen method of fixation, in which the insoluble coloring matter is held by coagulated albumen. The other, and by far the most practical way, is to prepare the goods with beta naphthol and then develop the red color on the fibre by dyeing in a prepared solution of paranitraniline. By dyeing is here meant the development of the color by passing the prepared goods through the appropriate diazo solution in a padding machine.

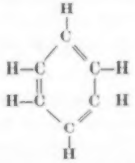
The base which has been previously treated with nitrous acid, or technically diazotized, unites with the naphthol on the cloth, producing an insoluble azo body on the fibre. The process thus briefly outlined will be the theme of this evening's talk.

There is a difficulty which arises at the outset in treating this subject, and which is, to a certain extent, unavoidable. I refer to the chemical names and terms which it is necessary to use. It should be remembered that these colors are quite recent and the chemicals required to produce them, having no common names, have gone into commerce under their chemical names, either entire, or somewhat abbreviated, such as beta-naphthol, alpha-naphthylamine, paranitraniline, etc. It is important for the right understanding of this subject to have these names explained a little. You will, therefore, pardon a digression at this point, while I try to administer a dose of theoretical chemistry and divest these formidable looking names of some of their terrors, if possible.

The chemist engaged in organic research finds himself confronted with a host of carbon compounds for which he must have some means of designation. Now what does he do? Just what every one of you do when you see some object for which you have no name, that is, name it by some of its properties. The chemist gives to chemical products, names which indicate or tell him something about their composition. Almost everyone knows what Glauber's salts are, but this arbitrary name tells you little about it. The chemical name

for this substance is sodium sulphate, a perfectly definite one. This is a very simple case. The carbon compounds are vastly more complicated, but the method is the same.

Aniline, it is well known, is the starting point for a long list of brilliant colors. It is derived from benzene or benzole. Do not confuse benzene with benzine, or light naphtha, so much used for cleansing purposes. Benzene has been carefully analyzed, and the simplest formula which will represent it, is six atoms of carbon and six of hydrogen, or in chemical notation C_6H_6. Chemists, in common with the rest of humanity, like to figure their conceptions if possible, and so instead of using the simple formula, C_6H_6, the chemist makes a picture of the way in which he imagines it is built, and calls such, a graphic formula. He says that his researches lead him to believe that benzene is composed of a ring of six carbon atoms with an atom of hydrogen attached to each one, thus:

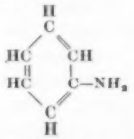


This is known as the benzene ring, or nucleus, and it can act as a unit and enter into combination, preserving its ring character unbroken through all the changes to which it is subjected.

It is not claimed that this theoretical conception of a ring of six carbon atoms has an actual foundation in fact; it may or it may not. No one has ever seen, or is likely to see, an atom or molecule, but, be this as it may, this theory has, nevertheless, been of immense service to organic chemistry in explaining observed facts and predicting new ones; so it matters little whether it is objectively true or not, since the benzene unit reacts and enters into combination just as if it were.

The hydrogen atoms may be replaced by other atoms or groups, and give rise to new compounds. For instance, if benzene be treated with nitric acid, nitro-benzene is formed $C_6H_5(NO_2)$. You see that one of the hydrogen atoms in benzene has been replaced by the nitro group NO_2. If now the oxygen in this group be replaced by hydrogen, no matter how, we shall get a substance called aniline $C_6H_5NH_2$, so called because it was first obtained from indigo about seventy years ago, the Portugese name for which is anil.

The chemist also calls aniline, phenyl-amine; phenyl, because he calls the unit, C_6H_5, phenyl, and amine, because he regards aniline as built on the ammonia type—ammonia, NH_3, consisting of an atom of nitrogen with three atoms of hydrogen attached. These hydrogen atoms may be replaced by other atoms or groups and the resulting compounds are known as amines. Representing this substitution of phenyl for hydrogen in ammonia would give $C_6H_5NH_2$ which is really the same thing as the graphic aniline formula



This is a very important term to remember, since it occurs repeatedly in the names which we are obliged to use.

The amines as a class are alkaline, or basic, in character, as might be expected of bodies on the ammonia type, and unite with acids to form salts.

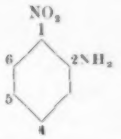
I shall not dwell on toluidine and anisidine, but simply call attention to the fact that they are both examples of amines.

In the experiment just tried, paranitraniline $[C_6H_4(NO_2)NH_2]$ was the amine used to make the red azo body. This is a very important substance on account of the fastness and brilliancy of the reds or rather scarlets obtained from it. This compound is similar to aniline, except that it has a nitro group in addition and introduces a new prefix, viz. para. Here we find a curious property of some organic bodies. If para-nitraniline be analyzed, it will be found to have about the following composition: Car-

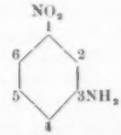
bon, 52.2 per cent.; Hydrogen, 4.3 per cent.; Nitrogen, 20.3 per cent.; Oxygen, 23.2 per cent.

Now there are several nitranilines having exactly this percentage composition, but which, strange to say, possess different chemicals and physical properties; that is, they have different melting and boiling points and produce different colors when made into azo compounds. How can this apparent anomaly be explained? The chemist explains it by assuming that the amido and nitro groups may have different positions in the ring relatively to each other. Let the carbon atoms in the benzene ring be numbered thus

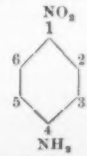
For convenience only the hexagon form is used without the carbon and hydrogen atoms being represented. Now if the two groups are next to each other



they are said to occupy an ortho position that is, either 1-2 or 1-6. When the nitro and amido groups have an atom of carbon between them, they are said to occupy a meta position



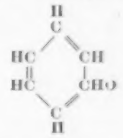
which may be either 1-3 or 1-5. When the groups are opposite and have two carbon atoms between them, the position is a para one.



To summarize, Ortho means adjacent; Meta means alternate; Para means opposite.

This property of compounds of the same percentage, composition possessing different properties, is known as isomerison, the root meaning of the term being equal parts. A very homely illustration is that of a door. It makes a great deal of difference whether the hinges are attached both at one side, both at the top or one on either side. A door with both at one side may be precisely like one with both at the top, but they will open differently, in other words the two doors are isomeric.

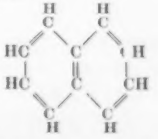
If a hydrogen atom in the benzene ring be replaced by hydroxyl thus



we get a very different class of compounds from those we have been considering. Such bodies are known as phenols and are acid in character as distinguished from the alkaline amides, and unite with alkalies to form salts. A good example of a phenol is the common carbolic acid. Another name in oxybenzene. By refering to the formula it will be seen that the carbon ring is intact, but one of the hydrogen atoms has been replaced by the unit HO. If two hydroxyls enter, then we should get di-oxybenzene better known under the name resorcine $C_6H_4(HO)_2$

Hitherto we have been dealing with a single ring of six carbon atoms, but the benzene unit may double with condensation, as chemists say, and the doubled compound may then act as a unit just the same as the benzene ring did and form amines, etc.

Naphthalene is a good example of this structure.

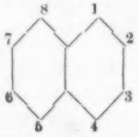


This substance is familiar in a crude form under the name of camphor balls. By referring to the graphic formula, it is seen that naphthalene has plainly a double ring, but

only ten instead of twelve carbon atoms, two being held in common. Naphthalene like benzene is composed only of carbon and hydrogen atoms and like the latter may, by the same chemical treatment, be converted into an amine giving rise to naphthyl-amine $C_{10}H_7NH_2$. This body in common with the amines is basic in character and unites readily with acids.

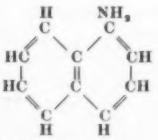
Like benzene if a hydrogen atom be replaced by HO, an acid body is formed known as a naphthol. The naphthols are thus analogous to the phenols. Here, too, isomerism may occur according to the position of the substituting group. Such compounds are designated as alpha and beta.

To make plain what is meant, let the carbon atoms be numbered thus,

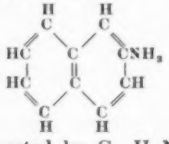


then the positions 1, 4, 5 and 8 are called alpha, and the position 2, 3, 6 and 7 beta. That is, if an amido or hydroxyl group enter the double ring at any of the points 1, 4, 5 or 8, an alpha compound is the result. If at the points 2, 3, 6 or 7, a beta compound is formed.

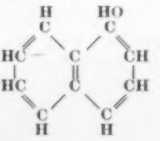
Examples are: Alpha-naphthylamine,



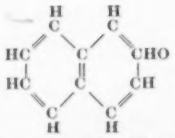
Beta-naphthylamine,



both represented by $C_{10}H_7NH_2$; and Alpha-naphthol,



Beta-napthol,



both represented by $C_{10}H_7HO$.

Alpha-naphthylamine is one of the most important amine bases used in the production of azo colors on the fibre. It also has the distinction of being the worst smelling substance in the world. The only thing that can compare with it in this respect is perhaps an old blood albumen solution in warm weather, and even here, I sometimes have my doubts. Beta-naphthol is the most important of all since it is used almost exclusively to prepare the goods which are to be colored.

The benzene ring may also double without condensation, giving rise to bodies with two entire benzene rings such as benzidine

$$\begin{matrix} C_6H_4HN_2 \\ | \\ C_6H_4NH_2 \end{matrix}$$

which is simply two aniline molecules joined together. Tolidine and dianisidine are other examples of this kind of doubling, but I shall not dwell upon these, only to call attention to the fact that they are amines.

The compounds which we have glanced at include only the most important ones and give an idea of the variety found in organic bodies. We have now a stock of names which will probably last us for one evening, at least, so if I should happen to speak of meta phenylene-diamine you will know exactly what is meant.

We have now reached the azo compounds by an easy and natural transition, as Mark Twain would say. Azo colors are made from diazo bodies, the latter not necessarially colored. Whenever the term azo is used, it means that the compound in question contains at least one pair of nitrogen atoms united thus—N=N—, with a bond open on each side to which other groups or atoms may join themselves. These nitrogen atoms, as just intimated, have the peculiarity, also, that they are linking atoms, and serve as the bond which unites organic groups. The distinction between diazo and azo

compounds is this, diazo bodies are produced whenever compounds of the amine type are acted upon by nitrous acid. The diazo body is in fact the intermediate product between an amine and an azo color. In diazo bodies, the azo group is united on one side to an organic unit and on the other to some acid radicle or group, thus: Diazo body:—(Some organic group like benzene or naphthalene)—N=N—(some acid radicle like chlorine or hydroxyl)

The process of making a diazo body is technically termed diazotising. Diazo bodies are very unstable compounds decomposing easily with evolution of nitrogen, some even explosively, when dry. It is consequently necessary to keep the temperature as low as possible, when making them, by the use of ice, hence the propriety of the name "ice color."

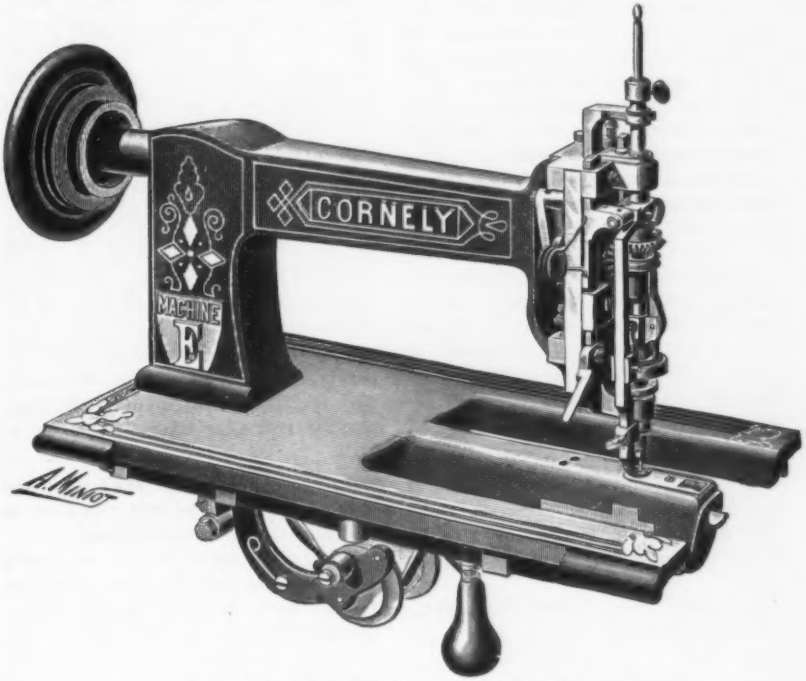
(To be continued.)

—Tasteful colorings will sell almost any style. Special care should be exercised in obtaining all colors pure and bright in tone.

The Latest Fashion.

EMBROIDERED HOSIERY.

For some time the importers of hosiery have had a rapidly growing demand for embroidered stockings for women, and hose for men. On account of the advance in the tariff, the importation of anything embroidered is almost prohibited, and our domestic manufacturers should therefore get the benefit of the increase in the demand for these goods.



EMBROIDERY MACHINE FOR HOSIERY.

We, therefore, illustrate on this page an embroidery machine for hosiery which is the machine used by the European manufacturers, capable of producing chain stitch ornamentation on finished goods, either in straight lines or fancy figures, embroidering plaid or plain stockings and hose. It meets a most decided want in the demands of fashion for embroidery upon this class of goods. The machine is a French invention, and is manufactured in that country. Wherever it has been introduced in our mills, it

has met with a marked degree of satisfaction, for the beautiful work that it can accomplish, and the fact that it does not call for highly trained labor.

It produces the chain stitch and the moss, or raised, pile stitch. It can work with any kind of thread, such as silk, cotton, wool or metal threads, and can work on any kind of material from the thinnest lace to the heaviest cloth.

The machine is provided with the universal feed motion turning all round, which allows it to execute any kind of pattern and to produce embroideries of the most intricate designs without turning the material which is being embroidered.

It does elegant work on women's stockings for evening wear, so arranged as to show the embroidery above the shoe or slipper.

It will embroider, in any desired manner, completed stockings, Jersey cloth, gloves, mittens, or any other article to which it is desired to apply this species of ornamentation. The work is done with the greatest refinement, surpassing any that may be performed by hand.

The sole American agent is O. J. Ahlstrom, 529 Broadway and 95 Spring St., New York, who is also sole agent in America for the new Kohler whip-stitch sewing machine, for sewing all kinds of full-fashioned woolen and knit goods.

The Lowell School.

Those members and guests of the National Association of Wool Manufacturers who accepted the invitation of the trustees of the Lowell Textile School to visit that establishment on the day following the annual banquet were well repaid. The progress that has been made in eleven months is certainly remarkable, and reflects great credit on those connected with the institution. The completeness of the equipment and the excellence of the methods of instruction pursued, convinces the most skeptical of the good results that are bound to follow from a course in the school, provided the pupil enters upon his work with the right ideas and knowledge of what he is there for. The machinery in the cotton and woolen spinning departments and the weaving have already been described in these pages, and upon the installation of the worsted plant, the equipment of the school will be completed, and practically all of their available room occupied. The Davis & Furber Machine Co. of N. Andover contribute a worsted card, while the spinning machinery is the joint gift of Stoddard, Haserick, Richards & Co., of Boston, and Prince, Smith & Son, of Keighley, Eng. The worsted machinery will be in operation very soon.

—Out of 100 spinning companies in Oldham, Eng., and district, quoted in the sharebrokers' list, only 15 are at par or over.

—It is well known that cotton, on being mercerised, assumes an increased affinity for coloring matters, and the idea readily suggests itself, that this fact might be utilized for the production of two-color effects in the dyebath.

—It is claimed for pineapple fiber that constant immersion in water does not in the least injure it, and the natives of the East Indies tan it, with a view of increasing this property, though this is probably done at the expense of some of its strength.

Progress in Cotton Manufacturing in Russia.

Read before the New England Cotton Manufacturers' Association, at Philadelphia, by Vladimir P. Polevoy.

(Concluded from January.)

With the enlargement of the spinning and weaving mills, their productiveness has also increased in consequence of the improvement in general construction of the mills, introduction of steam power machines and machine tools, and also in consequence of the increase of the speed of the machines. It may be surprising to hear that the average speed of looms in

Russia is 230 picks per minute, and in not a few of them the speed reaches the figure of 260 picks per minute. The replacement of naphtha as a fuel resulted in the decrease of cost of manufacturing yarns and cloth, notwithstanding the increase of wages. The economical side of the progress expressed itself in the use of steam of high pressure, in the introduction of steam engines of triple and quadruple expansion, and in the decrease of the harmful resistance in machine tools consequent to the improvement in their construction, the use of suitable materials in the parts of machines subject to friction, and generally in consequence of the investigation of the laws of friction and study of lubricating compounds made by the Russian engineers, and also by the widely spread use of indicators and dynamo meters for controlling the motive power. In some cases, electricity has been applied for transmission of power at a distance.

Regarding the technical personnel of our mills, it is noticeable that at the present time not only the majority of our weavers are Russian, but a steady replacement by the Russians of foreign colorists and spinners is taking place, and about one-third of all spinning mills are managed by Russian engineers; while as late as 1880, their number did not exceed fifteen. This is the result of the firm belief of our mill owners that the mills can be run safer and more profitably by the Russian than by the English managers, who, as I said before, in many cases have been put in their places by the trust without any consideration as to their ability to run a mill properly. It was found besides that the English foremen, overseers and managers were absolutely unfit to manage Russian workmen; it would be no exaggeration to say that nine-tenths of all the strikes in Russian mills were caused directly by the ungovernable temper and lack of consideration and forethought in English managers. It is a noticeable fact that whenever an English was replaced by a Russian manager, the mill would show from 5 to 10 per cent. more dividends. We have now quite a number of skilful foremne from among workmen of spinning and weaving mills, to whom it would be quite safe to entrust the supervision of separate machines in different rooms. But the demand in this direction, at the present state of industry, is still increasing, and to meet this many mills have started day and evening schools with special courses for the purpose of preparing men with technical knowledge for different departments of cotton mills. By this it is expected to fill up that gap in the organization of our mill labor, which made itself felt for many years. As to the higher technical schools, which could supply engineers able to take care of cotton mills, we have several such schools in Moscow, St. Petersburg and Charkoff. Regular classes on textile subjects form a part of the program in these schools.

Turning to the statistical data, borrowing same from the official sources, we see that, in 1892, there was in Russia 4,331,508 spindles and 100,634 looms. Comparing this with the number of spindles and looms in 1879, we see that the number of spindles increased by almost 25 per cent., and the number of looms by at least 20 per cent. At the present time the number of spindles reaches approximately the figure of 5,000,000, and Russia, by the vastness of technical means, occupies first place in Europe. Taking into consideration that in Russia quite a number of mills work both day and night (though lately there was a law promulgated forbidding night work by the workmen who work during the day, the law going into effect on January 1, 1898), when comparing the Russian cotton industry with same industry of other countries, it woud be right to state that our spinning mills have at their disposal 65,000,000 spindles and 200,000 looms, reducing the working time to the foreign working year of 3,000 hours (300 days of 10 hours each).

The amount of cotton consumed by Russian cotton factories is about 12,500,000 Russian poods (a pood is equal to 36 English pounds), or about one-tenth of the whole amount of cotton used in Europe and America; the tendency to use native grown (in our Cen-

tral Asia possessions) in preference to American grown cotton is still on the increase, and at the present time one-quarter of the whole amount of cotton consumed by our mills is from Central Asia and from Caucasus. About 9,000,000 poods come to the share of foreign grown cotton, American, Egyptian, East Indian and Persian. Thanks to the care of the government in regard to the development and improvement of our Central Asian cotton plantations, the area of the latter increased during the last seven years (1887-1893) almost by 125 per cent. viz., from 61,000 desiatin (a desiatin equals 2.9 acres) to 136,000 desiatins.

The extreme variety in the fabrics calls for the same variety in the kind of cotton; in some cases, short staple with rough fibre is used, like the Bokhara and native Caucasian (karagos) cotton; in other cases, for high numbers of yarns, for instance, Egyptian cotton of high grade is used, and also Sea Island stands in demand by our mills for some special fabrics. As regards the medium staples (midling, good midling and midling fair), which are mostly used in cotton industry, we notice the consumption of American cotton on the level with the increasing demand for Central Asian cotton, grown from American seed of different kinds. The Great Yaroslavskaia Manufactura (illustrated in November issue), which owns most of the Central Asian plantations, grows a peculiar kind of cotton of long staple, which was given the name of "wonder cotton," the length of the staple and its peculiar silkiness making it impossible to match the same even with the best Sea Island cotton grown in America. The writer had tried very hard to obtain in this country something approaching to the "wonder cotton," but the best authorities on cotton unanimously declared that no such cotton could be obtained anywhere else.

Notwithstanding the increasing demand for the native grown cotton, the importation of foreign grown cotton also increases.

The cotton brought from our possessions in Central Asia, such sorts as Bokhara, Samarkand, Tashkent and Caucasian, by the roughness and shortness of staple, generally speaking, represent the nearest approach to the East Indian cotton; but the Tashkent cotton grown from American seed differs very little from American grown cotton, and for certain numbers of yarns is used in preference to the latter. The culture of cotton is more and more improving in Central Asia, but in order to put our native culture of cotton on a firm basis, so that this important factor of our spinning industry could develop, it is necessary to establish a commercial classification of cotton, taking as a basis for this not only the degree of cleaning, but also the quality of the fibre (length and strength), which is very important in the spinning, and the regular classification of cotton will lead to improvement in the management of cotton plantations and in the methods of culture of cotton.

Our cotton mills until lately manufactured almost exclusively low and medium numbers of yarns, not above 70; now, however, little by little the manufacturing of high numbers takes place up to Nos. 130-40 and, as an exception, we see Nos. 200 and even 310 spun on mules. The numbers most usually spun in our mills now are Nos. 30-40 for filling and Nos. 30-34 for warp, which are required for weaving ordinary calicoes. The yarns spun on ring spinning frames are limited to warps and mainly to medium numbers. At the present time, however, as I said, the use of ring spinning frames is extended not only to the warp but to the filling yarn as well, both low and high numbers; medium high from No. 70, and high from No. 100 to No. 140, and even as an exception, up to No. 200.

Thread manufacturing, also, commenced to develop, promising in the near future to make it possible to wholly dispense with the necessity of importing thread from abroad. During 1885-1890, we received from abroad, on an average, of sewing and knitting thread about 140,000 poods each, while during the period from 1891-1894, the average annual import did not even reach the figure of 50,000 poods, in other words, the import decreased 2.8 times. Till about three or four years

ago, the expert of cotton goods from Russia did not amount to anything, but at the present time the export trade in such goods is assuming large proportions, mainly to Persia and China, and in some exceptional cases to South America.

It would be appropriate to mention the peculiarity of the Russian cotton industry, which shows itself in the combination in one concern of not only spinning and weaving of yarns and cloth, but also of the cloth finishing processes; and in one case, viz., the Great Yaroslavskaia Manufactura, we see a combination in one firm, manufacturers and cotton growers. This latter mill is considered at the present time the model cotton mill of Russia, which is undoubtedly due to the efforts of Messrs. Karsinkines, the owners, who do not spare any means in order to bring the working of the mill to the highest state of perfection. This is also due to the selection of the manager, professor of the Imperial Technical School, in Moscow, S. A. Fedoroff, who is an expert in spinning and weaving machinery, both theoretically and practically, and a scientific man of high degree. He has written several treatises on spinning and weaving, in which he threw an entirely new light on the theory of working of different parts of spinning and weaving machines. The testing room of the Great Yaroslavskaia Manufactura, founded by Professor Fedoroff, is one of the curiosities in Russia. The room contains all spinning and weaving machines and other preparatory cotton machines constructed on a small scale, just for tests, so that a small quantity of cotton may be turned into a piece of cloth, which, as is well known, cannot be done on machines of ordinary working size. This firm employs exclusively Russian engineers, and was the first to introduce American textile machinery in Russia. In Central Asia it owns three-quarters of all cotton plantations, and their manager there, N. V. Skobeyeff, who has the nickname of Cotton King, is an unlimited ruler of the cotton market in Asia. The Yaroslavskaia Manufactura appears to be the only independent cotton mill in Russia, on one side not depending on foreigners for cotton, and in the manner of machinery buying same from whom it pleases.

[*Exclusively for the Textile World.*]

Art as Applied to Every Day Life.

Paper read by Vesper L. George, of Boston, Mass., before the Lowell Textile School, Lowell, Mass.

(Concluded from January.)

Design or decoration must be, to some extent at least, conventional in order to be good. I do not mean by that a rigid stiffness and lack of freedom, nor do I mean to ignore natural growth; quite the contrary.

Perhaps I can illustrate this by an example. Suppose you have a wall to decorate. You want to put some floral design upon it. Now you could paint a spray of naturalistic flowers across it, as if they had grown there, but would that be good decoration?

The real mission of decoration is what the word implies, to decorate or embellish something else.

Now in this case the mission of the floral decoration is to enchance the beauty of the wall, not to destroy it, and I ask, would not a naturalistic treatment of flowers destroy the nature of the wall?

Take that same flower; draw, not any particular flower, but a figure that shall be unmistakably a type of that flower, and arrange it upon the wall as you will, either as a frieze, a dado, or a diaper, or all over pattern, and so long as you consider rythm, balance and harmony, you are sure to have a decoration that will be a delight to the eye and a satisfaction to the senses.

There is a prevailing desire among so many of us to paint realistic objects, especially flowers, upon everything.

Our china is all elaborately decorated with sprays of violets, roses or golden rod. But what have we done? Have we not lost sight of our china in the decoration. We select with great care some especially beautifully shaped piece and then cover it with a piece of decoration that never considers for a moment the object upon which it is placed, but completely annihilates it.

Instead of covering our ware with realistic productions which, at best fall far short of nature, suppose we try conventionalizing our motive once

or twice, just to see what effect it would have.

The realistic treatment comes really within the mission of the painter, and should be confined to canvas where it is admired for itself.

A decoration should be appropriate to the object upon which it is placed; never destroy or distort it.

I have in mind a floor I once saw made of diamond shaped tiles of different colors, so arranged that it gave the effect of innumerable cubes laid with their corners pointing upward.

Heavy floral designs treated realistically and with shells, as I have seen them, are certainly in bad taste, giving one the uncomfortable feeling that it is necessary to lift one's feet high to escape striking them.

Utility is another great thing to be considered. A pitcher for instance, from which it is impossible to turn milk without its running down the front, or having a handle that is impossible to grasp, is bad design. Yet it is difficult to find a pitcher of good design in our market. You can find elaborate ones. Oh, certainly, with flowers galore, and gold, and cheap at that, but good, never.

Draw pulls that are uncomfortable to the hands are in bad taste. Chairs that are uncomfortable to sit in are equally bad. I saw a chair only a short time ago that the dealer assured me was an accurate reproduction of one from Germany, as if that alone was sufficient guarantee for its good design. It happened to be straight and narrow in the back, flat in the seat, and to add to its discomfort, if possible, a lion's head was carved in bold relief in the middle of the inside of the back; imagine it.

It must have been some such chair as this that brought forth the remark, that it would take an acrobat to sit in it. But in this case I doubt if even an acrobat could sit in it with comfort.

Simplicity is a necessary quality in any decoration; (to know what places to ornament and what places to leave plain). One helps the other. Too much ornament is tiresome. Plain furniture is much better than badly ornamented furniture.

Good taste is never out of fashion. A woman who wears colors that are unbecoming to her, because they are the fashion, outrages her own tastes and the eyes of all her friends.

Now, let us see, we have learned that a design to be good, must be more or less conventional, I say "more or less," as there is a chance for hair-splitting on the question of how little or how much a motive may be conventionalized. I speak guardedly and hope, at a later date, to explain further.

We find that utility is the first consideration of design, that simplicity may be a virtue, that design must be appropriate to the object upon which it is put and subservient to that object, else it ceases to be a decoration.

We see that interest is gained by introducing variety and contrast in motive, whether the design is geometric or includes plant form.

With those principles understood, whatever we may purchase in furniture, wall paper, china, rugs or what not, we will be sure to use better judgment in our selections; for who of us would not know as much as possible about any subject with which we come in as close contact as we do with this one.

What is good does not always suit the people, however, because their taste is not always cultivated to the point of appreciating it. Hence the manufacturer claims that he has to cater to the popular taste.

However, I do not entirely agree with him as I feel sure that the taste of the people is kept back, in a measure, by the manufacturer.

If we go into a furniture store and do not find what we like, we are compelled to buy what is produced, or else go without.

It is our mission to raise the standard of the purchaser and the manufactured, as well, so that one can find what he wants and at the same time, what is good, and the other will produce what is required, which will also be good.

There has been no incentive in this country, to any extent, at least, to encourage originality in the artist or designer, unless indeed, we consider these spasmodic and short-lived art

fads, and even these are really tunes borrowed from the Japanese or the Renaissance and played in a different and generally less attractive key.

The designers have been forced to borrow from the styles of the past, or copy the present styles of European art. What we want in this country is a style of our own. By encouraging the artist to study the decoration of the past, for the purpose of learning the laws governing the best designs, then clothing the geometric forms, we have chosen, with motives suggested by the grape, horse chestnut, corn and innumerable other vegetable forms that lend themselves so readily to decoration, there is really no end to the possibilities of original work.

As soon as we give a man an incentive to develope, we benefit ourselves, by getting better work, and the artist, by adding a real joy to his labor.

For it is when the handicraftsman is allowed to put his own thoughts into his work that he is seized with a pride to excel in whatever he is doing. It is for the purpose of raising the standard of decoration and design in relation to textile fabrics that the Art Department has been added to the Lowell Textile School.

A large part of the study of decoration is common to all branches of decorative art and would be as useful to the interior decorator, wall paper designer, wood carver, or any of the industrial arts, as to the designer of textile fabrics.

Although the department is for the special purpose of improving the value of textile fabric, by placing good design upon it, yet students or artisans in any of the other art industries would, I feel sure, find this class a great advantage to them in their work.

As there is an evening class, even those who are at work in the daytime may take advantage of the opportunities offered by the school.

It is our desire to make the Art Department as great a success as the rest of the school, and, as principal of that department, I may be pardoned in saying that, as far as I am concerned, no stone shall be left unturned to make it all that the trustees desire it to be.

[*Reported exclusively for the Textile World.*]

Comparative Life of Cotton Machinery and Valuations.

Paper presented by Edward W. Thomas, agent of the Tremont & Suffolk Mills, Lowell, Mass., at the October meeting of the New England Cotton Manufacturers' Association.

(Concluded from January.)

The figures used by a gentleman in this country, who has had an extended experience in the valuation of mill plants and machinery, are as follows:

TABLE NO 2.

Percentage of Depreciation on Original Cost.

First, 5 years service 5%
Second, 5 years service 30%
Third, 5 years service 70%
Fourth, 5 years service 90%
End of 25 years service.....the machinery valued as "scrap."

Taking the depreciation, say at end of 15 years service, of machinery, and its value as per tables above would be as per table No. 1 (See January issue).

First, on 5 per cent. depreciation, reduced valuation 47 per cent.

Second, on 5 per cent. depreciation, original cost 25 per cent.

Third, on 7½ per cent. depreciation, reduced valuation 29.51 per cent.

Third, on 7½ per cent. depreciation, original cost 0 per cent.

On basis of Table No. 2, 70 per cent.

It would seem impossible then to establish any set rule, inasmuch as opinions vary so much.

The following information relative to cost of a modern mill plant of 1,000 looms on sheetings, averaging 28's yarn, may be used comparatively as showing the advantage the English spinner and weaver has in first cost of plant:

	No. 1.	*No. 2.*	*English.*
Mill Buildings . .	$120.000	115,000	103,500
Machinery	272,000	275,000	261,200
Steam Plant . .	36,000	45,000	34,500
Supplies and Furniture	53,000	45,000	45,930
Freights and Starting up	20,000	22,500	
Heating, Ventilating and Moistening	16,000	18,000	
Mis. and Contingencies		14,500	
	$522,000	$535,000	$445,130
Total number of spindles	33,500	30,000	46,080
Per spindle	$15.32	$17.83	$9.66

Figures in columns No. 1 and No. 2 were furnished by two eminent mill engineers of this country, and the

figures in column No. 3 by a large firm in England. As these figures given are estimates and not from actual facts, due allowance must be made in comparing. It will be noticed the large number of spindles required per loom in the English mill. The reason for this is the larger production the looms in English mills make over the American looms, as well as the lower production per spindle in ring spinning.

Some concerns allow for depreciation 5 per cent. per annum, from the original cost of machinery, others 7½ per cent. per annum from the reduced amount, or present value, the latter method making the charge for depreciation higher in the first years, when the machinery is new, and less in the later years. The depreciation allowed for mill building, steam engines and gearing is usually 2½ per cent. per annum.

A mill built in Oldham to spin average counts, say 28's to 36's warp, and 32's to 54's weft would cost as follows:

	Per Spindle.
Mill Building	9s. 0d.
Steam engines, boilers, gearing	3s. 0d.
Machinery	8s. 0d.
Accessories	2s. 6d.
Total	22s. 6d.

This amount might be considerably increased by elaborate buildings and other expenses. A mill to spin coarser counts, requiring a larger proportion of preparation machinery, on account of the larger production, would cost more per spindle, as also a fine spinning mill, on account of extra roving machinery for double roving, very light carding, etc.

I also append some facts given by another party well known from their large building transactions, not only in England, but in foreign countries: The special commissioner of the "Dundee Advertiser" who is making an extensive inquiry into the condition of trade in important industrial centres, has furnished the following interesting comparison between the cost of cotton spinning in Oldham and on the Continent: England still possesses the important advantage of cheaper mill construction than the Continent, the United States, and the East, as might naturally be expected, seeing that the bulk of the European and Eastern trade is in the hands of English machine makers. At the present time the cost of building a cotton mill in France is about 42s. 6d. per spindle. This is the estimate of F. Merttens, of Merttens & Co., shippers, Manchester. Below appears a table from the Memoire du Lloyd Rouennaise de la Filature, giving the comparative cost of mill construction in Oldham and Rouen, based upon extensive inquiries made a short time ago. Rouen is the French Manchester:

	Rouen.	*Oldham.*
Cost per spindle	40s. to 52s.	20s. to 31s.
Mill, spindles	28,000	78,000
Average counts	[French* 25's twist	37's twist.
Weekly Output	23,760 lbs.	55,400 lbs.
Operatives	126	212
Operatives per 1000 spindles	4.50	2.69
Wage per operative	15s. 8d.	£1:1:11
Hours of Labor	70	56½
Cost of labor (including management, etc.) for 28's, per lb.	0.99d.	0.86 per lb.

* equals 33's English.

The cost of erecting a mill in England is really below the figures given above. A leading official of the Federation of Master Cotton Spinners offers me as his estimate 22s. 6d. per spindle, for a fully equipped modern mill, with the very best machinery, although it is possible to build a mill at a less cost than that.

Many mills in Oldham have, it is true, cost 30s. to 34s. per spindle, but they were built when the fever for mill construction was high. It has subsided now, and very few additions are being made to the productive capacity of Lancashire. Mills of the most recent construction have naturally benefitted from the reduction in cost, but employers complain that the advantages arising from the improvements effected by Lancashire machinists have largely gone into the pockets of the operative, and that their gain has been confined to the increased production from the same amount of plant. About 220,000 operatives are now employed in the cotton spinning trade, in which there are over 45,000,000 spindles. Weaving employs about 315,000 operatives, work-

ing 660,000 power looms. Mr. Mertens estimates the output per loom per year at 1866 pounds of cloth. Fifty years ago the quantity was only 1234 pounds, and fifteen years ago it was 1808 pounds. The production per operative increased greatly until recently, when owing to the extra attention given to the finer cloths it has fallen off to about 39.72 pounds per operative, per annum, against 40.39 pounds in 1882. The average output in spinning mills is 6,660 pounds of yarn per operative. Fifty years ago it was only 2,754 pounds. It is a fact that England still beats the Continent in economical cotton production. The following explains itself: Operatives per 1,000 spindles: Oldham, 2.4, Mulhouse, 5.8; Voszes, 8.9.

The Oldham and Mulhouse comparison given above, does not refer to the same count of yarn, but when the difference is adjusted. Oldham is still immensely superior. The number of spindles of a pair of self-acting mules is in England about 2,000, as a rule. In Germany, it is from 1,300 to 1,600. In Lancashire, one spinner with two helpers will look after 2,000 spindles. In England, a single overlooker will control a mill of 60,000 to 80,000 spindles, the wage being 55s. to 60s. per week. In Germany, if an overlooker has 15,000 spindles in charge, he has his hands full. In Alsace and South Germany, the number of spindles range from 10,000 to 20,000. In one of the finest spinning concerns in Saxony, one spinner and four helpers are required for 2,000 spindles.

We give below some interesting details relating to a 10,000 spindle mill estimate for a plant spinning China and Japan cotton, which have been sent to us by a correspondent. The machinery which is specially constructed consists of 10,000 ring spindles, with all necessary preparation, and turns out 23,000 pounds of average counts per week of 72 working hours. The motive power consists of a compound steam engine of 350 h. p., two 28x7 feet Lancashire steel boilers, patent fuel economizer, and all necessary shafting, pulleys, stores, etc., complete. The total dead weight of the machinery is 510 tons, and the shipping measurement 1,120 tons. Further details as follows: "Everything as regards machinery and stores, is furnished complete, including sufficient mill stores for a six month's supply; also all boiler seating bricks and blocks, non-conducting composition, bundling presses, to make five to ten pound bundles; a hydraulic press, to make baled 400 pounds of yarn; main driving ropes and all strapping. Price, all complete, packed where required and delivered f. o. b. Liverpool or Manchester, £12,550; or c. f. i. Shangai or any other Chinese or Japanese treaty port, £14,755. Detailed estimate on application, also samples of yarn spun on this machinery from China cotton and cloth made from same. The machinery consists of one opener; two double scutcher and lap machines; 31 carding engines; two grinding machines; four drawing frames; three heads of five deliveries each; four slubbings of 64 sp. each; six intermediates of 92 sp. each; ten rovings of 128 spls. each; 40 frames of 250 spls. each; 40 reels; two yarn bundling presses; and one hydraulic yarn baling press. If required, the whole of the iron work for the building in one story, viz: iron columns, iron doors, ventilators, steam heating throughout the mill, window glass, and all small ironwork for the roof, f. o. b. English port £2,865, or £3,360 c. f. i. Chinese or Japanese port. Weight 350 tons."

Another large building concern in England furnish the following estimates of three classes of spinning mills of 50,000 spls. each:

Mill A—50,000 spl. on av. No. 32 yarn for print cloths would cost about $200,000 in the United States, for machinery, against about $110,000 in England.

Mill B—On an average 80's Egyptian carded yarns, about $160,000 in U. S., and $96,000 in England.

Mill C—on average 20's combed yarns, $460,000 in U. S., and $280,000 in England.

They also submit the following schedule of machinery for the foregoing mills:

MILL "A."

2 combined openers and scutchers.
7 single beater scutchers.
62 R. T. cards, 50" x 38".
168 drawing deliveries.

588 slubber spindles.
1536 Int. spindles.
5376 Fine roving.
24720 mule spindles 1⅜ gauge.
25000 mule spindles 1⅛ gauge.

MILL "B."

1 bale breaker.
1 porcupine single beater opener.
1 single beater scutcher.
40 cards 50" x 38".
105 drawing deliveries.
318 slubber spindles.
1200 Int. frame spindles.
5200 fine roving spindles.
50000 mule spindles 1⅛" gauge.

MILL "C."

2 combined openers and scutchers.
6 single beater breakers.
6 single beater finishers.
90 cards 50" x 38".
38 comber lap machines.
38 ribbon lap machines.
160 single nip combers.
240 drawing deliveries.
688 slubber spindles.
1690 Int. frame.
4988 fine roving spindles.
50000 mule spindles 1⅛" gauge.

The same party also gives the following as actual cost of some of the details in the construction of a modern mill (spinning) of 80,000 spindles, on 80's:

Excavations	$ 9,700
Buildings	97,000
Steam piping	750
Boilers	8,250
Engines	17,000
Shafting, belting, etc.	20,000
Bobbins and skewers	3,000
Card clothing	7,800
Other supplies and fittings	40,000

Machinery would cost in England from $2 to $2.15 per spindle without combers, and from $2.85 to $3 per spindle with combers, and four operations of roving machinery. The foregoing figures have been inserted to give some idea of the cost of the mill plants elsewhere than in this country, and form an interesting feature worth careful study.

In conclusion, it would seem that to establish any fixed rule for depreciating machinery applicable for all classes and departments of same, is, practicably, an impossibility, and that the true value must always be found from the exact condition of the machinery, and the following ought to be considered:

(a) The natural wear and tear;

(b) Comparison with what the same pattern of machines could be bought for in the market upon the time of valuation.

(c) Comparison with modern machinery of the same class in regard to production and first cost of same;

(d) Local conditions surrounding the machinery to be valued, its relation to the other classes of machinery in the mill.

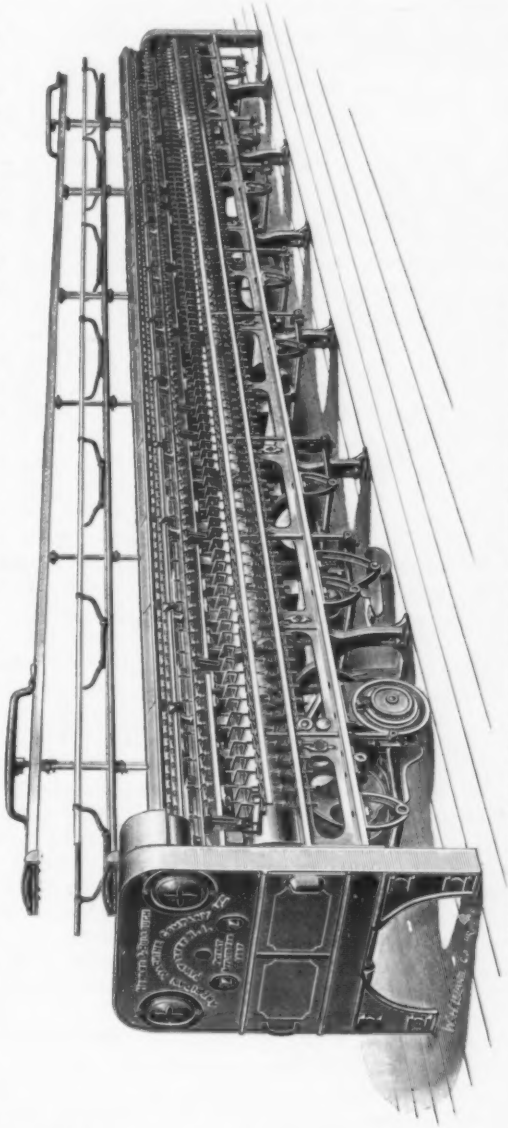
In establishing the value of mill buildings and power plants, the same general rules should be followed. Different mill buildings, as well as different classes of machinery, do not depreciate or wear out in like progression, and some portions of carding departments may be run under some conditions far longer than other machinery in the same department, thus rendering any set rule practically valueless, as applied to all machinery in that department and the plant generally. The subject is one of vital importance to the manufacturer, and one but comparatively little understood; and in cases known to the writer, where expert evidence has been introduced by either side in the case, there has been shown an astonishing variation in valuations as not only applied to complete mill plants, but to machinery and individual machines, as well; showing more forcibly than ever that the valuation of a mill plant complete should be taken as a whole, or a unit, or tool, with which to produce at a profit, if possible, a fair dividend on the plant. Its original cost has no direct bearing upon its present value. We must look at the plant as it is, and what can be done with it in competing in the market and earning a dividend.

New Spinning Frame.

BUILT BY HOWARD AND BULLOUGH AMERICAN MACHINE COMPANY, LTD.

We take pleasure in presenting to the notice of our readers the new pattern spinning frame recently brought out and now being introduced on the market by the Howard & Bullough American Machine Co., Pawtucket, R. I. This machine embodies many new improvements which have proved in

the machines already working to be of great advantage. The machines are built very low, so that they can be attended by small help; at the same time, they are particularly heavy so as to stand the high speeds of today without vibration and thus preserve the spindles. The creels are arranged with double creel supporting rods, so that the roving in the creels will be free of vibration and is not stretched through such vibration. All the different parts of the machine are planed or milled, and wherever two working parts come together they are tongued and groved. All of the gearing is cut, and particular care has been taken in designing the gearing that small gears are the drivers, thus ensuring easy running and requiring less power. The frames are made with either warp, filling, or combination wind.



SPINNING FRAME, BUILT BY HOWARD & BULLOUGH AMERICAN MACHINE CO

Taking up motion: In this motion only one gear is used, thus doing away with the changing of ratchet or taking up gears. The stop is set to whatever number of teeth is to be taken up for the different sizes of yarn. The changing from warp to filling wind, or vice versa, is accomplised by a very simple method, little work, and without loosening a set screw or bolt. No matter what methods or systems are employed, mill managers cannot do away with the carelessness of the help in doffling frames. Suppose that the rail when in position for doffling is at the top of the bobbin, to bring the rail to the bottom of the bobbin and doff the set, it may be necessary for the operator in many instances, to wind back the rack. This frame contains a new arrangement for this purpose. A foot lever or brake is provided. The operator by putting his foot on this lever causes the rail to descend to the bottom, and the action of dropping

the rail winds back the rack. At the same time preparation has been made so that if the operator does not wish to drop the rail to the extreme bottom it can be checked in any position of the wind or traverse.

Particular attention is drawn by the makers to the improved cap bars, roller stands and rollers. An objection has been made to cast iron cap bars in that in casting these, the fingers shrink in various directions, causing the top rollers to be frequently out of parallel with the bottom. This objection has been overcome by making only the spindle of the cap bar of cast iron, into which are riveted steel spindles or fingers which carry the cap bar nebs. These fingers are made in such a form that there can be no tilting of the nebs. The cap bar nebs are milled perfectly true, thus ensuring the top rollers being perfectly parallel with the bottom fluted rolls. In designing this new cap bar particular attention has been paid to the lubrication and cleaning of the necks of steel rolls and roller stands, and the cap bars are so arranged as to leave the roller necks entirely free so that they can be kept perfectly clean and lubricated without interfering with the top rolls or cap bars. The spread between the first and second rolls in order that the operator may adjust his bottom rolls for the different lengths of staples of cotton is accomplished without unweighting or disturbing the top or bottom rollers. Traverse rods are all made of iron, and any particular form of roving guides may be applied.

Any pattern of the leading spindles, such as Whitin, Draper or McMullen will be supplied with these machines. Alos any pattern of separators which may be specified. This shop has recently brought out a new separator. This separator works entirely free of the ring rail, and is suspended in brackets attached to the roller beam. It raises or lowers with the arm of the rocker shaft, and when the ring rail is descending it also works forward, throwing the point of the separator blade so far forward as to prevent any whipping or lashing over the ends. The tin cylinders are all made from specially heavy block tin, and the shafts of same are of steel provided with Woodruff keys. All tin cylinders are tested before being shipped. The bearings are of phosphor bronze, and provided with oil rings, thus ensuring perfect lubrication. The machines are supplied with out-riggers for supporting the driving pulleys, which can be supplied to either the gearing or off-end of machine. Either the Walmsley or Sharples' lifting thread board will be applied when so specified. The makers have brought out a new thread board device by which three different heights of thread board can be obtained, between the thread wire and point of spindle, to suit the ideas of the spinner. For re-levelling the frames a device is applied which renders any carpenter's work unnecessary. The foot of each Samson or spring piece is provided with a shoe and jack screw by which they can be raised or lowered to meet any unevenness in the floor. The lifting rods, as will be seen in the illustration, do not have any foot casting attached to them. Therefore can be easily taken out, cleaned and put back without the trouble of adjusting and setting.

In addition to the above points of advantage enumerated, will be found a number of smaller improvements which only require to be brought to the notice of practical spinners to be appreciated. The makers would be glad at any time to show these machines in process of construction at their shop, and also to show any parties interested, these machines at work in different mills.

Style Suggestions for Woolen Manufacturers.

The sale of goods during this season has been a surprise to selling agents, in many instances, it being a season when standard makes have had to take a background position, being forced to do so, particularly in the instance of kerseys, on account of the unloading of large stocks of goods.

Many makers of kerseys, endeavored to bring the buyer to pay the opening price, and did not sell their goods until the general opening. The manufacturers who did this, found the market very well covered when they did open, and needless to say at a much lower price.

Every large maker of clothing who had money to spare bought his goods for kersey coats, in October, November or December, and as the consumers had large stocks when the market opened, there has been very slow and very light buying, the only amount of sales being on fancy colors, where the buyer was not covered.

Some selling agents have tried to force a market for their goods by reducing the price of same. This is extremely bad policy, as it not only demoralizes the market, but tends to deteriorate the product in the eyes of users.

The largest sales were on the cheaper grades of kerseys and this field was exceedingly well looked after by one prominent mill, (Washington) which placed a large quantity of goods at $1.30. The largest volume of overcoating business has been done on coverts, as stated would be the case in these columns. This fabric, in fancy back effects, has sold very largely, the best lines being withdrawn.

Babcock's Department of F. Vietor & Achelis showed a cotton mix line of coverts at $1.90. These goods were compared with H. W. T. Malis and James Talcolt's lines, which are "all wool," at $1.80 and $1.90 respectively. Both the latter lines are sold up.

There will undoubtedly be a demand for fancy coverts in 16-ounce goods; and any manufacturer who is equipped to make these fabrics, will do well to commence his experiments early. The want which has not been filled in the fancy back covert market is that of a live green twist face, with a Scotch plaid back. There are backs of this character, but not the correct pattern.

Freizes were sold early and are not being shown at present. Meltons in suiting weights are shown by Curtiss & Warren at $1.42½, Wanskuck at $1.50, and the Auburn line is also out. In cheap cassimeres the cheviot effects are still shown by a few makers who have at last been woke up to the fact, by the size of the orders they are receiving, that cheviots are dead. Medium priced cassimeres are having large sales.

Cotton filled and cotton back worsteds are having a large sale. H. & W. H. Lewis are showing a line of this character at $1.25, $1.15 and $1.50, with an all worsted line at $1.70. The all worsted market is not fully opened.

New York Dry Goods Trade.

W. M. Smith, of Smith, Hogg & Gardner has returned from the South, much improved in health.

S. R. Stewart has allied himself with Devoe and Peck.

Kapp Bros. have moved to 292 Church St.

Thos. Kelly & Co. are to henceforth sell the blankets of the Buell Mfg. Co., of St. Joseph.

A. P. Piker has quit the banner of J. & J. Dobson, for that of A. D. Juilliard & Co.

Wendell & Nixon have new quarters at 53 Worth St.

Calhoun, Robbins & Co. have admitted James A. Smith, Robt. R. Walbridge and Chas. R. Pitt, Jr., as partners.

F. A. Foster & Co. have shifted themselves to 68 Worth St.

Bernard S. Kahn has been appointed resident buyer for the Dryfus Co., of New Orleans and Hammil & Co., of Mobile.

Back from Europe: D. W. Cook, of Dunham, Buckley & Co.; G. Legg, R. J. Beechinor, of A. S. Rosenthal & Co., in Paris; G. W. Brunball, of A. S. Rosenthal & Co., in Yokohama; H. S. Beer, of Alden & Rappolt; Geo. E. Beers, of Lord & Taylor; Louis Budell, of F. Vietor & Achellis.

Gone to Europe: J. Z. Batten, of Sweetzer, Pembrook & Co.; Frank L. Hughes, of the Tootal-Broadhurst Lee Co.

Fred Baker has been secured by the

Wm. A. Slater Mills. He was formerly with R. W. Kendall & Co.

Leopold Adler, of Savanah is now represented here by C. Schunpff, of 377 Broadway.

The J. Spencer Turner Co. has admitted Moses Neil as partner.

H. R. Alborn is now of Alborn, Henick & Co. He formerly represented J. M. Locke & Co., of Chicago.

W. H. Ford late with W. H. Childs is now with the Wm. A. Slater Mills Corporation.

The Faulkner Mills, of Lowell have lodged their selling interests with Fred Vietor & Achellis.

As Jacob L. Phillips has decided to retire as selling agent, Meyer, Heller & Long will soon take the representation of the Algonquin Printing Co. Adam Catterall will continue in charge of the account.

C. A. Auffmordt & Co. will sell imported laces for Henry M. Bloch, so long of S. E. Bloch & Bro., who is going into business for himself.

H. T. Milstead, superintendent of the Tallassee (Ala.) Falls Mfg. Co. is in town, with headquarters at 47 Worth St.

The department managers and salesmen of the H. B. Claflin Co., recently gave John C. Eames a dinner at the Waldorf Astoria to mark his election as a director of that concern.

W. H. Bayne moved to 53 Worth St., February 1.

R. V. Johnson has taken the Southern representation of S. E. Bloch & Bro.

B. C. Miller is back with Wheelwright, Eldridge & Co., after six months of illness.

J. F. Remsen formerly with Slater & Sons has gone with Danforth, Clark & Co.

H. Lee Mallory and A. H. Clark will as Mallory & Clark, act direct agents for mill knit underwear at 55 Leonard St.

C. J. and Alex Alexander are now with Boessneck, Broesel & Co.'s woolen goods department.

Nostrand & Moore will hereafter sell for the Kent Woolen Co., through H. A. Caesar & Co.

Wm. Schade has been engaged as buyer and manager of Lee, Tweedy & Co.'s silk department.

H. D. Lockwood is the new selling agent of the W. A. Slater Mills.

Ballin & Taylor have succeeded G. & J. Ballin.

J. W. Sweet has gone with H. J. Libley & Co.

Doull, Miller & Co. have transferred their foreign dress goods and trimmings departments, to the corner of Broome and Mercer Sts.

Abegg & Rusch have admitted Henry A. Rusch as a partner.

Robt. Reis & Co. are soon to move to 580 Broadway.

Beckman Remington has taken his woolen goods business to Doull, Miller & Co.

Roman striped ribbons in bayadere effects are prominent among late importations. It is not often that boldness and richness are so combined in silk designs.

Wash fabrics show a variety of corded effects arranged to form stripes and plaids. By intercepting these with nubs of vari-colored yarns a novel appearance is gained.

Printed foulard silks are in increasing request. To many these goods are known as silk serges. In these, spiral and floral effects are most common. Many shades of color are used in combination with the white designs.

Bayadere weaves predominate in foreign dress goods for spring. They are shown in wool and silk mixtures in jacquard patterns, in matelass weaves, the raised designs running across the piece forming broken stripe and figure effects, in fancy overshot effects in wool and silk mixtures and in poplins, the silk running to rich metallic colorings on quieter grounds. Beside these weaves are seen on granite and vigorlaux grounds, also diaphanous weaves of the grenadine order and crepon effects on transparent grounds.

Lappet weaves, also leno and lace grounds are in the van among wash fabrics. Open-work styles suggesting grenadines are noticeable in this connection.

Cotton Market.

At present writing, the price for middlings is 5 5-16 c., the same as quoted by us last month, showing no change, with slight indication of any immediate advance or decline. Everybody seems to be in a waiting mood, to see what course the planters are likely to take regarding planting for next season. A strong pressure is being brought upon planters to curtail their area of cotton planting, and representatives in Congress from all parts of the South have been addressed, asking that they will advise their constituents to heed the warnings that are made against another large cotton crop and low prices. There has been a tendency of late years to an overproduction of cotton, without any pecuniary gain to the planter. The immense crop of nearly ten million bales in 1894 brought less to the planter than the smaller crop of 7,550,000 bales, the previous year. We think it is a mistake, however, for planters to follow the advice of using less fertilizers, so that a smaller yield per acre shall be obtained. It would be much better if the farmers would study the economy of using fertilizers and increase the yield per acre, and reduce the area of planting. Notwithstanding the unsatisfactory state of manufacturing in the North, the spinners' takings for this section have been nearly 350,000 bales more since September 1, than for the same period last season. The Southern mills have also increased their takings to the neighborhood of 25,000 bales.

Wool Market.

There is a continued activity and firmness in the wool market. The sales indicate a desire on the part of manufacturers to supply themselves with stock, with an apparent purpose of covering orders in hand. The purchases of late have been mostly on the part of small mills, the larger mills being well stocked ahead from purchases made several weeks ago. The advance in the price of wool, however, has been greater than the advance in the manufactured article, the former having been from 50 to 60 per cent. within the last twelve months, while the latter has been only from 20 to 30 per cent. Notwithstanding the high import duties, purchases of wool in foreign markets for American consumption are on a comparatively large scale. In the neighborhood of 10,000 bales was bought for our manufacturers in the late London auction sales. Crossbred wool, shrinking 38 per cent., for 56's, brought 11½ d. There is a considerable amount of wool on the way from Australia, which is expected to arrive during the month of March. In the late London sales, greasy Australian merinos showed an advance of five per cent., as compared with the closing of the last series. Ohio XX and above is quoted at 30 to 31c. A large part of the stock on hand of this grade is held at 32c. As usual, territory wool is in a strong position, commanding in the neighborhood of 50c. clean. River Plate wool appears on the market, on the whole, in good condition, as regards softness of staple; notwithstanding traces of the effects of drought are noticed in some of the lots. The merinos are of good length and strength, though a little thin in the fibre, while Lincolns and crossbreds are mostly of a very useful style. The Montevideos are less burry than usual.

—They are experts in Lancashire, Eng., in the sizing of yarns, and no matter how poor the yarn, the slashing department can change the appearances, and very little difference is noted in the weaving department, whether the yarn was of good American cotton or of East Indian and American mixed, few could tell.

—American manufacturers have said that while an exchange is suitable for England it is not for America, because the former is a large exporter; but it is well to remember that there was little or no export trade from England previous to the establishment of a general mercantile exchange.

COTTON DEPARTMENT.

[*Especially for the Textile World.*]

Textile Designing.

[Lecture by V. I. Cumnock, superintendent of the Boott Mills, before the Lowell Textile School, Lowell, Mass.]

(Continued from January)

The next largest proportion of cloth manufactured is the twilled fabrics: these include all from the three-leaf drill for export, to the five and six harness twilled dress goods and sateens for printers' use, both cotton and woolen, and as they can be woven with slight modifications on what is called a plain loom, or one in which the harnesses are operated directly in a regular way from cams. The designer has little to do with them other than making new organizations.

It is, therefore, when the threads are taken from their regular intersections and are combined into various weaves, and colored threads are used to form the pattern, that the designer begins to show his skill. Generally, he has a sample of the cloth wanted; and it may come to him in any size from a piece one inch square upwards. He then counts the warp and filling threads, and by comparison with known threads, gets the size of the yarns, from which facts, the width of the cloth being known, the weight per yard can be obtained. Thus the entire organization of the fabric is known.

The pattern or design next occupies his attention. Taking the cloth in the hands, with a needle pick out each filling thread, putting it on the design paper (specially prepared for the purpose in the fact that it has a series of lines cutting each other at right angles, forming squares about ⅛ of an inch in size), putting a cross where the filling goes under, and leaving a blank where it goes over the warp thread. By treating each successive filling thread thus, a series of crosses will show the movements of the warp threads, and after sufficient threads have been taken to make them repeat on all four sides, namely: top, bottom and both sides, a "pick-out" will have been formed.

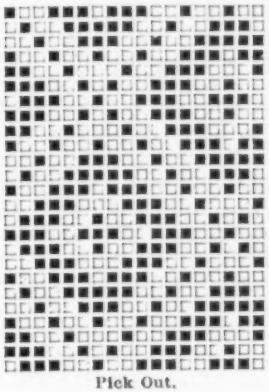
An examination of the "pick-out" will show exactly the up and downward movements of the warp threads, and starting at the left hand, by taking each different warp thread and placing it in a column, will be given what is technically known as the chain draft (Fig. 8,) and then taking each thread as it comes in the pick-out and putting it opposite its number in a horizontal position, you will have the drawing-in draft (Fig. 9). You now have all the necessary data to finish the calculation. It will be found by starting at the left of the pick-out that there are a certain number of threads to the pattern; then, as we have already counted the number of threads to the inch, and knowing the width of the cloth, by multiplying the two latter facts we know just how many threads there are from selvage to selvage, or what the warp will contain, and by dividing the total number of threads in the warp by the number in the pattern, we have the number of times the pattern is repeated across the cloth.

The rest of the calculations are made in the same manner; each colored thread in the pattern can thus be located and number known, the number of eyes in each harness known, and in fact all the necessary knowledge of that pattern is at once at hand. In this kind of work, the above represents too large a proportion of the daily occupation of the American designer; there is little else than accuracy required. Of course, familiarity with the different weaves, enables a designer to often times say at a glance, without making the pick-out, that the fabric will take a certain number of harnesses. He can also make all the necessary calculations for the chain and drawing-in drafts in the same manner.

I shall try to show here some of the reasons why a designer has to spend

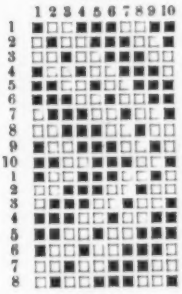
so much of his time as a copyist, and in the simple work of making a sample of cloth, some one else has already designed. The most important reason is the distance of the loom, or practical part of manufacturing, from the market. There is many a cus-

FIG 7.



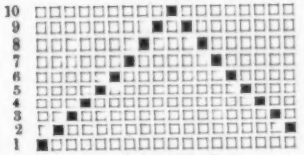
Pick Out.

FIG. 8.



Chain Draft.

FIG. 9



Drawing in Draft.

tomer ready with a large contract for goods, could he but reach someone who was able to tell him exactly what a piece of such goods would weigh, or how it would look with this or that weave, and how to obtain a certain effect. These and all kindred questions can be answered only by the expert designer, who, in almost every case is at his loom many miles and several mails away. The salesman who takes the order can only turn to some swatch he has at hand, which may or may not illustrate the desired idea, and send it to the mill, which takes time. This design, after being operated upon by the designer, is returned to the customer, and nine times out of ten the whole process has to be repeated at much waste of time to both customer and mill.

The time is coming when a mill doing a fancy business must be represented, at least part of the time, in the market by an expert designer, and as there are very few in the large business centres at present, this is another opening for younger educated designers. To do business in such a market, however, a man must be trained to know the market as well as the loom, and to know the market one must serve a long apprenticeship there. You will readily see that a good knowledge of textile designing opens a very wide field both in the mill and in the market (and by the market, I mean the large jobbers and converters), and the sooner the market realizes the value of the textile designer, the sooner shall we place cloths which have an individuality of American workmanship. Then, and not before, shall we cease to be copyists.

To hold our own with the manufacturers of other countries, we must adopt their customs, or modifications of them suited to the peculiar requirements of our market, and place within the immediate reach of the customers the knowledge of what our mills can produce and the cost of doing it. The time is not far distant when to manage a mill properly will require not only a good knowledge of carding, spinning and weaving, but also a thorough knowledge of textile designing, for after the yarn is carded and spun it can be intelligently combined in cloth only by such knowledge.

Designing varies very much in the different kinds of mills. The Jacquard designer of a carpet has to deal with coarse yarn, strong colors and large designs; his pattern lines making large jumps, compared with the designer of a brocaded silk with its fine yarns, deli-

cate colors, high slay and pattern lines which look almost like a curve until one sees them under a magnifying glass, where, even in this fabric under the glass will be found the right angle intersections, noticed in the plain cloth.

The Jacquard designer has at his command any multiple of the total number of threads of his tie-up for the pattern, and can lift at will any or all of the threads at one pick, his object being always to get sharp, clear lines in his leaf or scroll. In fact, this principle goes with all designing. Where different weaves or colors approach one another the lines should so stop as to cut off sharply and leave a clear edge.

The woolen or worsted designer has perhaps the most difficult task, for, with all the complications of the different weaves, both Jacquard and dobby are his. The fabric, when it leaves the loom is less like the finished product than any other, having to go through more processes than, for instance, the carpet which is put on the market after some slight shearing, almost directly from the loom. The heavy double woolen cloth with its complicated weave and tie-in, looks very little, when it leaves the loom, like the over-coating it is to be. Its progress through the dyeing, fulling and teazeling make it into a very different looking fabric. Each of these processes alters it, and the designer must keep his eyes open, close to his work to get accurate results and bring out in the finished state the proper weight and count. The losses and gains must all be calculated and the work carefully done in order to insure successful cloth. In this grade of designing, the materials in use are of such a value that the greatest skill is required to use the various yarns to their best advantage, and to get the colors located in such a way as to produce the best effect. There is, however, very little to prevent originality on the part of the designer.

The damask and brocade designer has less to do with organization, and more with the artistic part. His work lies in making his coloring and design harmonize to the best advantage. He has at his command a large number of threads, or colors, or both, and can use them in almost any quantity as the value of the fabric lies almost wholly in its beauty and finish. In this latter class of designing, as there is less of the staple product, so is there less limitation, and the designer has much freedom of thought and opportunity for originality.

It is a well known fact that when the opportunity is given to produce original designs, and there is a genuine call for such, the American skill is quite equal to the foreign. This is well illustrated in our silks and wall papers. Some of the best of the latter are sold largely in the English market and have been known to have been re-imported.

The gingham designer has almost entirely to do with color. He relies entirely for his effect upon his skill in getting new combinations of colors, and so placing them that they form new designs. His weaves seldom vary much from a plain weave, therefore his weaving changes are very slight. He, however, is obliged to place many different styles on the market in, say, the 6½ cent grade, and quite as many in cheaper grades, so that when one remembers that almost all colors vary in cost, it is easy to understand that it becomes quite a puzzle to him as to whether he can afford to round out the line with certain colors. To bring one line within the cost limit, he may have to use entirely different colors as to quality and quantity. Imagine an artist trying to copy a flower and being obliged to think whether he would better use blue or red because one cost more than the other! Yet this is one of the important parts of a designer's skill in this class of designing.

The cotton designer, especially one in a large mill, with a varied product has a very interesting position as well as a difficult one. His work covers a wide field and to a certain extent a knowledge of almost all other kinds of designing enters largely into his daily work. From the fact that generally a large quantity of cloth is

made from one design, it becomes necessary to look to every detail from the warper to the loom. The size or number of yarn, both warp and filling, plays a large part in the cost and effect of the fabric, and many times the weight will at once determine whether the design is a success or not. He must also bear in mind the production of his loom and so construct the pattern that it will have the proper effect first, and yet at the same time be a good weaver, for slow complicated weaving will add too great a cost to his pattern; and in figuring on contracts, it will often times happen that the designer who constructs with the greatest skill, secures the order. His work is generally confined to the dobby loom with which he is supposed to be able to copy any piece of Jacquard woolen, with cotton yarns or in fact make anything the market may desire.

It is in copying other fabrics that his knowledge is most tested, for there is always a desire on the part of the shrewd buyer to make cotton take the place of wool. Many times this can be successfully done. The cotton designer is also responsible for the character of the weaving done at the mill, to be able to give the reason for, and the cure of, all the ills to which the weave room is heir.

(To be continued.)

Yarn Topics.

BY W. I. HANNAN.
Corresponding member of The Manchester Microscopical Society, England.

ARTICLE I.

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Egypt and India are the principal countries that cater for nearly the whole of the spindles that are used for the spinning of cotton yarns. The production of the latter are dependent upon the demand that there is for cotton or mixed goods, and the changes which fashions often bring about.

Each country has a reputation for certain particular goods, which may either be stout or flimsy, according to the use for which they are required and the climatic conditions the people have to endure.

At one time it was considered an unwise act for England to export its yarns to other countries, and so strong was the feeling engendered that a bill was brought before the British House of Commons to prohibit its exportation. Happily the bill was thrown out and England took its proper place as, perhaps, the greatest yarn exporting country of the world.

For a long time England was the Mecca for other countries to go to, not only for the production of yarns, the making of the most elaborate and useful machinery, but the workmen of England were considered to be rather ahead, or the masters of the situation. In the cotton spinning world, they feared no competition and felt satisfied that no countries could, or would, run them a keen race for the supremacy in the spinning of cotton yarns.

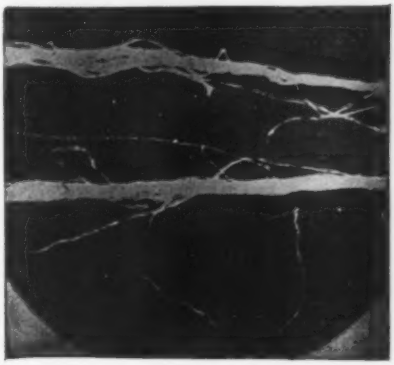


FIG. 1. FINE COTTON YARN.—350.

The race is now being run. There is almost a fight for life in the keen competition to supply good yarns where they are required. The humidity of the cotton districts in England has been a potent factor for modifying the adhesion of the fibres, in spinning a good yarn. This desiderata has been felt by other countries and Necessity, that benign Mother of Invention, has responded to the call, and offered the use of fresh air humidifiers, drosophores and water humidifiers, all of which are being adopted by the principal spinning firms in the different countries of the cotton spinning world.

There are other matters that might be touched upon, such as equality in the hours of working, the cost of living, and the energy displayed by the workmen in their life and duties as citizens of an empire.

Fig. 1 is a photomicrograph of yarn spun at the Manchester Jubilee Exhibition in 1887. On that occasion visitors streamed in from all parts of the world, and cotton machine makers vied with each other in having machinery fitted up that would spin the finest of utilizable yarns. Probably the finest yarn that was spun at the above exhibition on the self-acting mule was 350's, which is shown in Fig. 1. The machinery annex was large enough to allow of certain machine makers having a full complement of cotton spinning machines, from the opener to the mule, or ring spinning frame, whilst others only showed the mule as a specialty; but, in all cases the machines were working with the material passing through them, and visitors, from abroad particularly, were invited to inspect the machines, with a view to getting orders, and every little detail as to the manipulation of the cotton fibres were explained to them, whilst they eyed the machinery over, and at other times jotted down the information they received from the attendants.

To spin fine yarns over 300's counts in the machinery annex, was a difficult undertaking, owing to the many doors and other outlets that were considered necessary for ventilating the building. Nevertheless, two Bolton firms of considerable reputation, each fitted up a mule specially adapted for spinning full counts, over 300's, and on one of these mules the yarns magnified in the above illustration were spun.

To the naked eye it was very level yarn and reflected the highest credit for its production. It was extremely sericious and glossy, and specimens of the yarn in the cop form for future reference were very much coveted, and very many applicants were wisely refused.

The yarn is interesting as showing what Lancashire machine makers could spin under adverse conditions, what perfection the self-acting mule has been brought to, and how freely was given to enquirers the methods by which it was done. In the illustration the lowermost yarn is a good example of how Sea Island fibres dispose themselves in the core and surface of the yarn. When a yarn is magnified, its irregularities are also enlarged, but the uniform levelness of the lowermost yarn shows that very few of the fibres have left their position, and that fewer still are spreading on the surface. In the uppermost example there is a slight deviation from the above particulars. As a utility yarn, it is, perhaps, as fine as can be reasonably spun upon the self-acting mule. There was no intention that the yarn should be ornamental, but rather that it should lead the way in the yarn world for its fineness, its levelness, and its usefulness. It was a noble achievement in the history of cotton spinning.

Hopper Feeder and Opening.

WM. SCOTT TAGGART.

The introduction of the hopper feeder into the preparing processes of cotton spinning, has had a wonderful effect in simplifying and cheapening this department of the industry. The machine itself has long been known in the woolen and waste trade, but America, I believe, first saw the utility of its application to cotton machinery and from the first, the simplicity of its adaptation and the excellency of its results gave an impetus to its adoption such that, at the present time, extraordinary circumstances must exist, to prevent its forming part of the equipment of any mill, be it new or old.

Under these circumstances a few words of description, on its present construction and working, may not be out of place. First, however, let us examine into the question of its necessity and the cause of the delay that arose before it became recognized as a useful adjunct to a spinning mill.

Hand labor has been, from time im-

memorial, the only method of feeding opening machinery. Its character, although important in some respects, has been very insignificant in the number of hands employed, and probably on this account very little attention was paid by inventors for dispensing with it. It was also a poorly paid class of labor and this may account for a little of the neglect displayed at improvement. The automatic working of machinery, with a minimum of attention, has so permeated every phase of mechanical industries that at last, by a species of evolution, the feeding of an opener was effected by it, and from its just inception, a wonderful improvement has been brought about in a variety of directions.

It is too well known what the result, of even the best hand feeding, is in

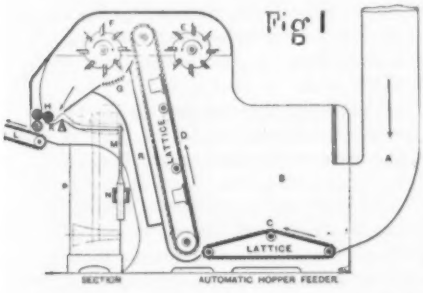


Fig 1

the regularity of the finished work whether lap, sliver or yarn. The constant care of the overseer was necessary, if fairly good results were to be obtained: but when this hand feeding is replaced by a hopper feeder, no such thing as anxiety need be felt, as it is immeasurably superior to the human hand in the uniformity of its work, the continuity of its action without attention, and the increased production resulting from the combination of these characteristics.

Another and even more important feature of a hopper is its use as an opening machine. No yarn ever spun possessed more than a small percentage of the aggregate strength of the individual fibres of which it was composed. Much of this, no doubt, is caused through the severe treatment the fibres undergo in the opening processes, and any preliminary procedure, which reduces the severity of such action as we have in an opener and scutcher will go far to produce a better and stronger yarn. In the hopper, this course is adopted, for in addition to the regularity of its action we find an opening action performed which is almost ideal in its working, and which gives to the machine one of its strongest recommendations.

Let us now examine the machines and see if they bear out the above interpretation. Fig. 1, presents us with a section through a hopper feeder, stripped of several accessories that are now applied to work of the better class. Fig. 2, is the same machine with all the most modern improvements applied to it. It is necessarily more costly, but its results amply compensate for the additional outlay.

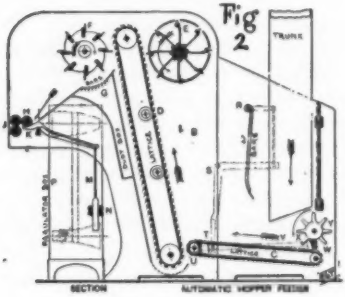
Referring to Fig. 2, which will be used to illustrate the description, the trunk "A" is filled with cotton from the mixing, or even direct from the bale breaker. When the trunk is filled it will not require replenishing for another half hour or hour, if the room is high. At the lower end of the trunk is a spiked roller "Y" which is driven through the worm wheel and worm "X" and "W" from a side shaft "V." The side shaft is driven from the end "V" of the bottom lattice "C." As the spiked roller revolves, it passes the cotton from the trunk "A" on to the travelling lattice "C" and this carries it forward until it brings it against the upright spiked lattice "D." The pins of this lattice carry the cotton upwards and as it passes the revolving clearer roller "E," the superfluous cotton is knocked off by the pin which project from the surface of "E." The cotton is now carried over the top of the lattice and as the spikes on "D" are now inclined in the opposite direction, it is an easy matter for the beater roller "F" to take the cotton from them by means of its flexible flaps, around its surface. In this action, the cotton is driven against a series of grate bars at "C" and to

some extent, loose sand, leaf motes, etc., fall into the dust box below.

From this point, the cotton passes forward through the rollers "H" and "J," where a pedal regulating arrangement is now generally placed, before it is conducted to the feed part of the opener.

To get the very best results out of the hopper feeder, it is found necessary to maintain, within certain limits, a fixed quantity of cotton in the open part of the machine, as in "B." To do this an automatic device is required and one of the most successful arrangements in this direction is the one illustrated. Its action is as follows. The spiked delivery roller "Y," continues to revolve and gradually the open space at "B" is filled with cotton. The weight of this mass of cotton presses upon a series of hanging bars "Q," or it may be a wooden door which is capable of swinging from a shaft "R." The bars or door "Q" are

Fig 2



balanced by weights so that when the weight of cotton in "B" is in excess of the balance weight, the bars "Q" yield. A series of levers, as shown in the drawing, transfer the movement of "Q" to the point "T," where a clutch arrangement is shown on the side shaft "V." The shaft is therefore taken out of gear with "U" and its stoppage naturally stops the feed delivery roller "Y." No more cotton is therefore admitted until the amount of cotton in "B" is sufficiently reduced in weight so as to permit "Q" to fall back to its original position, when, in so doing, it actuates the levers and puts the catch box "T" into gear and so starts the delivery roller again.

The upper clearer roller "E" plays an important part as a regulator, for by its means only a level layer of cotton can be carried over the top of the lattice. The surplus cotton is knocked back into the space "B." In order to keep the teeth of "E" always clean, an arrangement of eccentrics is adopted, which causes the teeth to project through the casing of "E" as it approaches the lattice, but which recede within it after it has performed its clearing action. In this way the teeth are kept free from accumulations of cotton fibres.

Cotton Sweepings.

Editor Textile World:

You will excuse me with respect to a query that appeared in your December number, on Cotton Sweepings, from a Lancashire, Eng., correspondent. Your answer was perfectly right.

I have had this subject on my mind scores of hours. What a pity it is that there is no better use for them; one super has told me that he could not get above 2 to 3 cents a pound for his cop waste. I made two or three suggestions with the result that he sends no cop waste away at all. It is all broken up and made into yarns of lower counts, and answers as well for the purpose as yarn spun from pure cotton, and produces a far cheaper cloth. By far the greater portion of domestics produced in England are made from waste yarns, and all the low-priced towels, such as honeycomb, huckaback and lerry; such yarns give more bulk to the towel than would be the case if made from pure cotton filling. There are thousands of looms in the old country that use nothing else but waste filling.

There is also made out of card room sweeps, a yarn that is called "bump." The waste can be bought in England for 2/6 per score, or 3 cents per pound, and sometimes it is very scarce at that, on account of the enormous quantity used.

It has struck me that some one will

be visiting this country when he finds the exceedingly low price at which different kinds of waste sell. This "bump" yarn is wound into balls, and shipped in thousands of tons every year to all parts of the globe. Sometimes it is used for packing glass and crockery ware. It commands a very good price for torch wicks for mining and other purposes, and is used in balls for candle wicks in those countries where the use of electricity or gas is unknown. Besides, all this "bump" is used for manufacturing purposes, as for the making of a colored spread, called by the trade "Alhambra quilt." The yarn is taken and bleached, and then wound on to pirns for the weaver. In one town, alone, there are 60,000 of these spreads made every week, and 15,000 prayer mats for the Hindoo and other temples, besides yergo rugs, horse cloths, and chouipats for India. The latter is a cloth with a kind of checker-board woven in the centre. Animals are also woven in the centre, such as the elephant, tiger, etc. There is also a very low spread made out of the same material, but the filling requires to be bleached in the hank before weaving, on account of the grease in the yarn, that should be destroyed before it can be bleached, and when taken from the loom be ready for the market.

I can well remember the time when all this and other low waste, was laid in a heap and allowed to rot for manure.

There are lots of other uses that it can be applied to. The yarn fetches 6 to 7 cents a pound, gray, which shows a good profit, considering the enormous output.

Different mixings produce different results. Ninety per cent. of the honey-combs made in England are from waste filling, and shipped in immense quantities all over the world. An enormous quantity of a little better waste is used for backing for toilet or Marseilles quilts. There is a vast amount used in Scotland for the manufacture of dice and damask spreads, on drop-box looms, pick-and-pick, one of "bump" followed by one of colored wool, about 180 yards to the ounce, and linen warp, which makes a very handsome spread. It also makes a double-faced colored spread, pick-and-pick, as before, only the weave is plain on both sides which makes a very handsome quilt.

Out of cop waste are made thousands of cotton blankets, that are printed with various patterns. All the low spreads of satin weave are made of another blend of waste.

I could go on with weaves of different kinds, all having waste filling for the main body of the cloth. Large quantities are put in for backing for carpets.

The machinery at first used was old cards, reclothed, and a piecing machine, but afterward the condenser system was adopted by a gentleman in Derbyshire, which has been generally adopted with this advantage, that there is obtained better parallelism of the fibres than by the old method. The old piecing machine, however, is still in use for certain classes of torch wicks for rits, etc. I have samples of most of the goods I have named, among them samples of the "bump" yarn and higher counts.

Trusting this may be of advantage, to some one, I remain yours,

JOSEPH BRADSHAW,

Montreal, Canada.

Japan's Enterprise.

BY ONE IN THE CONSULAR SERVICE.

If we are wise we will get our eyes on Japan and keep them there. The greatest menace to our manufactures and to our commerce comes from the England of the East. Nothing is neglected by the Japanese to aid their manufactures and to extend their commerce. Japanese students, who worked once in Saxon and Thuringian mills, have gone home, opened factories and have driven their teachers out of Eastern markets.

Japanese students, about to leave Moscow and Odessa, for home, arranged with their consul in Odessa, to open an exhibition of Japanese goods. The movement was backed up by

Russia as well as by Japan. Three large halls were filled, not only with Japanese goods, but with wares especially suited or adapted to European (Russian) needs and tastes. There were bamboo articles of all kinds, fine toilet and tortoise shell articles, chinaware, vases, etc., faience, terra cotta, porcelain, glass, bronze, antimony, etc. wares. There were wooden clocks, wall and table clocks, elegant writing papers, writing utensils of all kinds, lithograph presses, woolen and silk goods, tricots, flannels, playthings, soaps, tooth pastes and powders, beer, cigars, cigarettes, metal lamps, candelabra and chandeliers, musical bells, instruments, gongs etc. The exposition offered everything from the simplest article used in office or kitchen to the costliest used in art gallery or king's cabinet. The articles of everyday use, because of their excellent workmanship and cheapness, in spite of Russia's enormous duties, will sell in great quantities.

Cotton goods were offered at exceedingly cheap prices and in excellent qualities. A dozen ladies' hose was offered for 2-58 marks, or $0.61. One dozen knit cotton shirts, plus one dozen drawers, of good work and finish, were offered for 16-12 mk., or a little less than $4.00. One dozen shirts for 5-80 mk., or $1.28. If we add the Russian duty of one gold rouble (about 60 cents) per pound, we find that one shirt of Japanese make, in Russia, costs only 40 kopecks, whereas shirts made in Russia cost a rouble or 100 kopecks. This cuts off competition. Half hose, socks, cost 58 kopecks, or 30 cents per dozen pair; textile gloves, 1.10 roubles, or about 65 cents. Woolen blankets of a very good quality, with beautifully colored designs sell for 2-50 roubles; and cotton ones for 0.60, 1.20 and 1.40 roubles. Lamp burners sold for 1.05 roubles per dozen, lamp chimneys from 20 kopecks upwards, per dozen.

The Japanese are intelligent, enterprising and energetic. They have ransacked Europe for facts, they have gone and are going out into all the highways and byways of earth offering their wares. They have enormous bumps of imitation. A nation so equipped, thus endowed, will grow more and more dangerous.

If we are to win our way in the world beyond the seas, if we are to hold even our own, we must wake up to the fact that a silent, successful rival is behind us. We must do as others do, we must work as others are working, have worked, and are willing to work. We can count only on efforts equal to or superior to the efforts of others. Japan is doing as Germany has done and is doing. She is learning the languages; she is opening industrial, industrial art, and technical schools; she is imitating us and others; she is asking what customers want and she is going to get and give it to them. This, one of the secrets, if such a sensible thing can be called a secret, is one of the causes of this empire's success. It will aid Japan, it will aid us, it will aid anyone and everyone who wants to build up an export trade. Nothing must be neglected, if we are to win new and keep old markets. Of course, there are Pillars of Hercules in trade, beyond which Japan and Germany cannot go. The nation that has the greatest natural resources must win, if it knows how or is willing to learn how to use them. Japan's cheap wages and the cheap wages of Germany will work against us for a long time, but wages are not always going to be against us. Japan's and Germany's wages will go up; they are bound to. A rising tendency has been recorded already. We have to look to it that ours do not tend downward.

—The present state of the hosiery trade in England, is far worse than has been experienced for some time past. In some districts nearly all firms are on short time, work practically finishing at dusk.

—One bar to originality at present, is the fact that we are not, as a nation, leaders of the styles which appear season after season, either in character of design or color, and therefore being thus limited, we follow the importations from other countries.

WOOLEN DEPARTMENT.

How to Design a Cloth.

THOS. R. ASHENHURST.

(Continued from January.)

Now that the general principles are laid down, the detailed work of building a fabric may be carefully looked into. The first conception may produce a fabric too heavy or too light, or the structure may not be exactly what is desired for the purpose. Then an alteration must be made, but there must be a definite understanding whether an alteration must be made in weight only; the same character of structure being retained or whether the alteration must be made in both weight and structure.

For convenience, suppose that the starting point is made with a worsted coating serge, to be made from 2-30's warp and single 14's weft. Then following the general rules, I have already laid down, it would be necessary to find the diameters of the two threads thus: $\sqrt{560} \times 15 = 92$ nearly, or 92 is the approximate diameter of the warp thread, and $\sqrt{560} \times 14 = 89$ nearly, or 1-89 is the approximate diameter of the weft thread. Then $1\text{-}92 + 1\text{-}89 = 45$; so that 45 threads per inch would be the maximum number that could be put in a cloth without compressing the threads and making no allowance for bending.

In other words, 45 diameters of the warp threads and the same number of diameters of the weft would occupy the space of one inch, if they were interweaving as a plain cloth; but if making a serge of, say, the weft passing over and under three threads, alternately, then by the rough general rule there being two intersections only in six threads as against six intersections in a plain, it would be $45 \times (6 + 6 \div (6 + 2) = 45 \times 12 \div 8 = 67\frac{1}{2}$ ends per inch, as the maximum. But taking bending into acount at an angle of 60 degrees with the vertical, or line of vision, then the shortest way is to divide 45 by the square root of 3 or 1.732. Thus $45 \div 1.732 = 26$ nearly, which represents the space from the centre of our warp thread to the centre of the next, on the assumption that bending is taking place in the weft only. If bending takes place in both, an addition must be made.

For convenience and to simplify the working, this addition may be one-half the diameter of the warp thread, and the result will be near enough actual truth for all practical purposes. Then this will represent what may be termed the minimum number of threads for the plain cloth, and each intersection would be represented by this, 1-26th of an inch. But in the serge, there would be 4 threads where no intersections occur. Therefore, the space occupied by your complete patterns would be equal to the diameters of four threads and two of those triangles of intersection or $(1\text{-}92 \times 4) + (1\text{-}26 \times 2) = 8.3$, or 8.3 patterns per inch; and there being six threads in the pattern, $8.3 \times 6 = 49.8$ ends per inch, which is practically the minimum number of threads per inch with which a good cloth can be made.

It may be that this cloth would be too heavy or too light for what is required. To determine this, the simplest method is to find the weight of, say, a yard of any given width. Coatings average about 54 inches wide. Then, for convenience, say there are 50 ends and 50 picks per inch: $50 \times 54 \times 16 \div 560 \times 15 = 5.3$ ozs. of warp and $50 \times 54 \times 16 \div 560 \times 14 = 5.5$ ozs. of weft, or 10.8 ozs. per yard of cloth.

This would be a very light fabric for a coating, but, as already pointed out, this is the minimum, and it would be perfectly safe to work up to an average between this minimum and the maximum given of $67\frac{1}{2}$, which would be $58\frac{3}{4}$ per inch. Then the weight of the cloth will be increased considerably and will be stiffer and firmer to the handle. It is a good plan to work to the minimum, for the designer knows

then that he has reached the lowest limit of safety, and very few cloths are made which absolutely comply with the strict rules laid down. I am speaking now from a practical point of view, and not pinning my faith absolutely to theoretic rules, knowing as I do the difficulty of complying with them at all times, yet recognizing the value of them as a foundation upon which to build.

Now comes one of the operations which will test the designer's ability and his knowledge of fabrics. This cloth is too light, yet it possesses all the requisite characteristics, and in making it heavier all its features must be retained. There is only one way of doing it and that is to increase the bulk of the individual threads and decrease their number in the same ratio. In the same way, if the cloth must be made lighter the bulk of each thread must be decreased and the number increased, so that increased weight means coarseness, and decreased weight fineness.

As pointed out in previous articles, the diameters of threads vary in the ratio of the square roots of their counts, so that if the cloth is to be made heavier, the increased bulk must be in that ratio. Hence, if this cloth must be increased to 14 ozs. per yard, the proportion will be as 14:10.8 :: $\sqrt{2\text{-}30}$: $\sqrt{x}$; or to simplify the working, square the relative weights so as to raise them to the same power as the counts. Thus, as 14^2 : 10.8^2 :: 2-30 : x, which will be 2-18's nearly. Then the alteration in the number of threads will be in the fixed ratio of the altered weight, or as 14 : 10.8 :: 50 : x, or 31½ nearly. The weft must be dealt with in the same manner so that the counts will be as 14^2 : 10.8^2 :: 14 : x or about 8.3, and the picks diminished in the same ratio.

The difficulty will at once suggest itself that this cloth will be too coarse looking, hence, the designer must cast about for means of joining his end by other means. I have taken here the minimum amount of material which may be used to produce a reasonably sound cloth, consequently have left a wide margin between that and the maximum, or even what should be aimed at, when possible, the happy medium.

My object is to put this in a practical form without insisting upon the strict mathematical basis, for it is often practically impossible to adhere to strict rules, but those rules will always tell with unerring accuracy what is the extreme limit on one side or the other. Then the designer's duty is to find the two extremes and exercise his judgment to find the mean between the two, so as to obtain that cloth which will meet the requirements of the case, and produce a cloth suitable for his purpose and of proper weight.

When weights and structure are both to be altered, the conditions, in one sense, will be altered altogether, but the same general rule will remain good. Take any count of warp and weft for a starting point, and work out the maximum and the minimum number, as well as the average or true structure, and from that starting point any increased or decreased weight can be obtained with absolute accuracy.

In manufacturing fabrics, as in all other businesses, no set laws can be followed with absolute rigidity, yet they must be observed to some extent, and always to the extent that the two extremes must be avoided. Let the designer know when his cloth will become too stiff or inflexible, on the one hand, and where it will become too soft and unstable, on the other, and he will avoid falling into either of the errors, and can rely on building fabrics both useful and presentable.

Silk Finish on Non Silk Fabrics.

Of late there has arisen a very well defined demand for a process which will impart the peculiar qualities which distinguish silk, as a fiber, to other fibers in the textile world, such as cotton and wool. This is done often by chemical means, and several different processes have already been exported and patented. To understand somewhat of the nature of the demands in the case it is necessary to

look at the peculiarities of the silk fiber as such.

The one quality that outranks all others is undoubtedly the strong capacity that the silk fiber has of reflecting the rays of light that fall upon it. By this power the silk fiber has a lustre and brilliance that no other known fiber can approach. Each individual fiber possesses this quality. Of course, when a fabric is woven of many millions of these fibers, the whole fabric must possess the same brilliancy and in a somewhat similar degree. This quality is due very largely to the shape of the silk fiber. If a silk fiber is looked at under the glass, it is seen to be flat and ribbon-like, rather than cylindrical, as all other fibers are to a more or less extent.

Now any one knows that a cylinder reflects light directly only from a straight line along its surface, while the flat side of this ribbon-shaped fiber would expose a considerable breadth to the action of light. Now, when these fibers are spun into yarn and woven into cloth, they form innumerable angles all over the surface and body of the pieces. These angles, made by the sides or flat surfaces of the ribbon fibers, constitute a series of irregular mirrors of microscopic size, yet each reflecting light to and from each other until the whole surface of the goods glistens as a result.

Take this principle, and apply it to any fabric. In example, suppose a fabric of any kind receives a slight pressure; by so doing the surfaces of fibers here and there are given a different plane of exposure, and if the pressure is not too great it will produce a slight lustre. But if the pressure is increased to such an extent that all the surface is reduced to a dead level of uniformity, the angles are all destroyed and light is not reflected as in the preceding case, but the surface acts more as a mirror. The mirror reflects the light, but all in the same plane and same direction, and no lustre, properly so called, can be thus produced.

This explanation of the cause of silk lustre will show the true inwardness of one means which is employed to make other than silk fibers show the silk appearance. If it is desired to give the power of so reflecting light rays as to produce a true lustre, we must treat the fibers in some way which will cause them to expose plane surfaces in countless numbers at angles with others of a like kind. If this can be done much of the silk effect will be produced.

One way by which this is done is to take a cylinder, like a stamp or die, and make upon it the impression of the microscopic appearance of a silk surface. This can be and has been done, but it is a process of great expense and the stamp lasts but a short time. Still, when other fabrics are properly pressed, or stamped, with this die under correct conditions, the silk lustre is, to a certain extent, obtained.

But a more feasible method is to engrave a number of small reflecting surfaces, above described, into a steel plate or cylinder. The angles at which the surfaces meet are various, and the surfaces vary in size and form; but the idea is to fill the plate with an innumerable array of these little angular reflecting surfaces. The breadth of the surface we would naturally expect would be the same as the ordinary silk fiber surface, but this is not necessarily the case. If the surfaces are even broader than those of the silk fiber, they will answer just as well, but they must not be so broad as to be noticeable by the unaided eye. On the cylinder stamp or die so made, these little reflecting angles must be arranged in lines to somewhat resemble the conditions in the silk threads as they lie in a silk cloth. As the cloth passes under the stamped cylinder, the lines of the threads in the goods and on the cylinder will correspond.

The pressure must be considerable, and a high temperature will materially aid in producing the desired luster. It is possible, too, to steam the goods, either before or after the stamping, if the condition of the fabric permits it. It will be found that this method will show a very good silk appearance on all kinds of fiber, vegetable or animal, or mixtures of both, and even the appearance of silk itself is enhanced by it, if it is properly applied.

MANUFACTURER.

Science and Practice of the Construction of Woven Textures.

FRED BRADBURY.

(Continued from January.)

It is interesting to note that the average angle produced by the weft remains unchanged, whatever be its thickness, providing the warp lies perfectly straight. This truth is clearly illustrated at Fig. 11a. In this example the diameter of the warp is represented as before, viz: 1-60 of an inch, while the thickness of the weft is reduced to 1-120 of an inch. The diagram is constructed in the same way as Fig. 11. The same letters in each diagram refer to corresponding parts, and the subsequent reasoning is identical in each case; consequently, it is not necessary to repeat here the process of construction and reasoning.

The setting of the fabric in this case equals $(1 \div 60) + (1 \div 120) = 1 \div 40$,

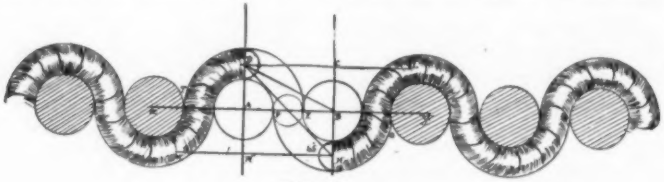


FIG. 11A.

or 40 warp threads per inch and 120 weft threads per inch. Each of the foregoing examples, including any change in weave, may be reduced to and solved by the application of the following formulæ:

Formula III applies to the set of threads which are perfectly straight in the finished fabric, and is as follows:

Total diameter of straight threads, plus total diameter of interlacing threads in one repeat of design, divided by number of threads in one repeat of design, equal the fractional part of one inch which each straight thread in the finished fabric should occupy; that is, $[(2 \div 60) + (2 \div 60)] \div 2 = (1 \div 15) \div (2 \div 1) = 1\text{-}30$ inch, and the denominator represents the number of threads per inch.

Formula IV applies to the set of threads which perform all the bending in the finished fabric. Take the denominator of the diameter of the bent thread in the direction of the length of the piece, and it represents the number of threads per inch, thus: Diameter of weft = 1-60 inch, or threads per inch = 60.

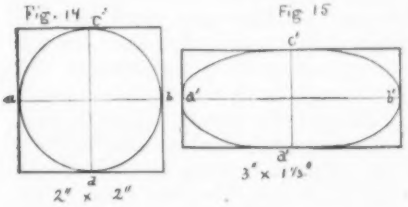
But we have previously stated that the natural tendency of two threads of unequal diameters—other factors remaining constant—is to cause each other to bend relatively according to the cubes of their diameters. This is quite true. But "pieces" are frequently made in which, during the process of manufacture both sets of threads are somewhat bent out of the straight line, and subsequently, in the process of finishing, the warp direction of the cloth is drawn out until the warp threads are in a perfectly straight line and the weft is made to produce all the bending.

The writer has had experience in cases where "pieces" produced from 70 yards of warp, have, after the first cut of warp, yielded from 69 to 69½ yards of cloth, when returned from the dyeing and finishing operations. Upon extracting a few warp threads from the cloth they presented a perfectly straight line, whereas the weft threads distinctly showed a series of corrugations. This kind of treatment is particularly adapted to "glacies" or lustre goods, and certain kinds of union coatings. We shall consider examples in this former class first. In these goods the best result is obtained when the weft is much thicker than the warp.

It has already been shown that the angle of 45 degrees represents the maximum number of degrees which it is possible for the weft to form with the horizontal, when the warp remains perfectly straight. Any increase in this angle would disturb the straight line of the warp, and, further,

the distance apart of the warp was shown to be equal to one diameter of warp plus one diameter of weft, when the angle formed by the weft is 45 degrees and the warp is straight, whatever be their relative diameters. It is necessary to remember these facts since their application is involved in a consideration of what follows.

In glacies or lustre goods, the cross section of the weft is cylindrical when weaving. The warp and weft are slightly bent out of their straight line, but during the process of finishing the warp is pulled out to a perfectly straight line, and the weft is made to perform all the bending. Further, the weft in the piece is compressed until its cross-section forms an ellipse and so that the diameter of the weft in the direction of the piece or warp



is increased from one-third to one-half of its original thickness. The result of this is that the surface of the weft appears flattened, and consequently the lustre of the yarn is increased, which is still further improved by the angle formed by the weft, which usually varies from 30 to 45 degrees.

It will therefore be apparent that if the diameter of the weft is increased in the longitudinal direction of the piece, the number of picks put into the piece cannot equal the number of diameters of the weft when it is being woven, but that the number of picks which the piece must contain will be equal to the number of diameters per inch of the altered condition of the weft. Further, if the weft is increased in diameter in the direction as above, it will be decreased in diameter between the warp threads, which of course makes it possible for the piece to contain more warp threads per inch. It is, therefore, necessary to find these two diameters of the weft, which is comparatively an easy process, since the area of the cross-section, whether it be circular, or compressed to form an ellipse, remains unchanged.

If we assume that the circumscribing line which encloses the circle at Fig. 14, be a fine silk thread whose thickness is ignored, and we afterwards arrange this same length of thread so as to enclose an ellipse as at Fig. 15, the area thus enclosed must necessarily be the same,—the the only difference being in the shape. It therefore only becomes necessary to determine the increase in the diameter "a′ b‴" and the decrease in the diameter of "c′ d‴" (Fig. 15, as compared with the original diameters "a b" and "c d," respectively, in Fig. 14.

In theoretical mechanics we are taught that the area of a circle is not only equal to "Trs," but also to "T" ÷ 4 multiplied by the circumscribing rectangle, where "T" equals 22 ÷ 7, and "r" equals radius.

For example: assume diameter of circle, Fig. 14, = 2 inches.

Hypothesis: Area of circle = "T" ÷ "r²" [equation 1],

Also area of circle = "T" ÷ 4 × circumscribing rectangle ("a b") ("c d") [equation 2].

Proof:

Area of circle in equation 1 = 22 ÷ 7 × 1 × 1 = 22 ÷ 7.

Also area of circle in equation 2 = (22 ÷ 7) × (1 ÷ 4) × (2 ÷ 1) × (2 ÷ 1) = 22 ÷ 7.

Consequently, assuming that the diameter of the circle (Fig. 14) be compressed until its form becomes that of an ellipse as at Fig. 15, the area of the ellipse will be exactly the same as that of the circle, and by the aid of the formula (equation 2), we may readily determine the diameter "c′ d‴" if we know or allow for a given amount of increase in the diameter of the circle across "a b" due to compression.

For example: assume the amount of increase in the diameter "a′ b‴" is equal to ½ its original diameter; then the diameter of "c′ d‴" (which it will be necessary to know when construct-

ing cloths) can be determined as follows:

Area of circle (Fig. 14) = "T" = (22 ÷ 7) × (1 ÷ 4) × (1 ÷ 4).

Diameter "a' b"' (Fig. 15) = 2 + 1 = 3 inches.

Area of ellipse = "T" ÷ 4 × (a' b') (c' d') = (22 ÷ 7) × (1 ÷ 4) × (3 ÷ 1) × (x ÷ 1).

Then, since area of circle and area of ellipse are equal to each other,

(22 ÷7) × (1 ÷ 4) × (3 ÷ 1) × (x ÷ 1) = (22 ÷ 7) × 1 × 1.

hence ¾x = 1

and x = (4 ÷ 3) = 1 1-3 inches, where x equals diameter (c' d').

The proof of this is further confirmed if we consider the area of the square as compared with that of the rectangle.

Area enclosed by the square or rectangle which contains the circle (Fig. 14) = (a b) (c d) = 2 × 2 = 4.

Area enclosed by the rectangle which contains the ellipse (Fig. 15) = (a' b') (c' d') = 3 × 1 1-3 = 4.

If we apply the foregoing knowledge to the construction of those fabrics in which the diameter of the threads undergoes a change due to compression, we shall then be able to construct our fabrics, not only upon scientific principles, but we shall eventually see that the results thus obtained coincide with actual fabrics, whose perfection in construction is placed beyond all doubt, by their appearance, handle and demand.

(To be continued.)

Textile Ornamentation.

BY FENWICK UMPLEBY.

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CHAPTER IV.

The noble dames of old did not long remain satisfied with subjects drawn from the Old Testament for the ornamentation of their work, but required other subjects drawn from the great epic poems of mediæval chivalry, and the pleasant legends of classic times. All monastic ateliers and workshops, therefore, fell into disfavor as the people desired to have their costumes decorated with designs from subjects other than those which belonged to the church. Accordingly, secular workshops became of more importance, and from this time they began to arise in all parts of the polite world.

There has been much controversy concerning the pieces of tapestry, generally known as bayent tapestry, which, according to tradition were worked by or under the management of Matilda, the wife of the Conqueror. A photograph of this exquisite piece of fabric may be seen in the museum at South Kensington; it is a representation of the events connected with the invasion and the conquest, the size of the original is said to be one foot, eight inches wide and two hundred and fourteen feet long, it is divided into 72 compartments and contains more than 760 figures of beasts and birds, 623 of men, 49 of trees, 37 of buildings and 41 of ships.

Giselle, the wife of Saint Stephen, was very clever in the manufacture of textiles, and by her inducement, her royal consort, the King of Hungary, attached to his palace an establishment for weaving and embroidering, and to this queen's female servants is due the honour of the invention of the famous embroidery generally known as "Point de Hongrie," by which expression are technically known three stripes laid side by side, ladder fashion, used chiefly in embroidering the plumage of birds. The Anglo-Norman ladies are said to have been exceedingly clever in ornamenting textile fabrics.

The looms of Artois, which during the terrible Merovingian period had almost ceased to produce during the French dynasty, were revived and at last they recovered their former renown. The products of these looms had already been highly esteemed in imperial Rome, and though the Romans may have preferred the work of the Phrygians, they still had recourse to the woolen stuffs of Gaul, the reputation of which had long been universally established. The stimulus im-

parted to trade by the first crusade was destined to give great expansion to the art of textile ornamentation.

Previous to the Roman invasion, Britian appears to have been far behind hand in the art of manufacturing cloth, and knew nothing of weaving, but on the other hand they had from the earliest of times possessed native textile products, varying both in the materials and designs, but of the same colors as those of the distinctive garments worn by the three traditional Bardic orders.

In peace the upland inhabitants, besides hunting, tended their flocks and herds, but with little skill of country affairs; the making of cheese they commonly knew not, wool and flax they spun not, gardening and planting many of them knew not, clothing they had none but what the skins of beasts afforded them, and that not always, yet gallantry they had, painting their own skins with several portraitures of beasts, birds and flowers."

Flax is now to be found growing wild in many parts of Great Britain, and we should suppose that in the time spoken of, some of this common, yet useful plant would then be growing in large quantities, but our forefathers must not have known its value for clothing purposes, if they had we surely should have found a trace of it in the shape of some clothing or other covering, as it was their common practice to bury their dead in the best garments they had, but we do not find any remains of fabrics of their weaving.

Dr. Rock gives us an instance of the use of woolen stuffs in these dark ages, but they were not woven but plaited. He says, that while cutting through an early Celtic grave hill, they came upon a body which had been wrapped, as was shown by the few unrotted shreds still cleaving to the bones, in a woolen shroud of course and loose fabric, wrought by the plaiting process without a loom. However, the Britons did not spend their time idly and in vain whilst occupied in the Roman workshops, and the example set by the Romans was not lost upon the brave and noble Britons; they soon set to work to copy the arts and handicrafts of their conquerors, and during the time of the occupation, they learnt the mysteries of weaving, also the culture of flax. During this period we have very little information as regards textiles. At a later time the Saxons reintroduced the manufacture of several kinds of woolen cloths, which were made chiefly for home and domestic purposes, and during this epoch the art of manufacturing cloth grew to considerable importance, and was recognized as one of the principal industries. Embroidery was introduced, and the ladies of this time also became noted for their skill in using many colored silks, as well as threads of gold and silver, an article which became universally known as English work. They were taught the use of the spindle and distaff, and we read that Edward the Elder sent his son to school and his daughter to work wool. Again, the Saxons developed a national school of art, the original germs of which seem to have been brought from the North by the first Scotch and Irish missionaries, and from the South by the Roman Evangelists.

(To be continued.)

England's Woolen Trade.

Speaking quite recently to the members of the Keighley Textile Society, England, Swire Smith made some observations on foreign competition in the woolen trade and on the causes which had lost England some of her trade. Twenty years ago, he said, this competition was in some respects quite as great as it was now, but those who were bold enough to speak of it and to warn the people of this country of its dangers, were laughed at rather than seriously regarded. He used to have an old friend at Glasgow who in his youth, say about sixty years ago, was one of the first to commence taking woolen yarn from the West Riding to Glasgow to be woven. At that time, for every pound of fore-

ign yarn used in Glasgow and neighborhood, there would be a hundred pounds of English yarn, but in later years that proportion was reversed. He found that, while in 1862 1,500,000 lbs. of woolen yarn were imported from Belgium, in 1894 the imports from Belgium and the Rhine provinces, woven in Glasgow and neighborhood, had increased about tenfold, and amounted to 15,000,000 lbs. It might be said that England was now importing yarns of this character from abroad which would be equal to the output of fifty factories of ten cards each. When the Royal Commission on technical education was formed, it was one part of the duties delegated to them to ascertain something about the extraordinary competition which English spinners had to contend with, and it fell to the lot of the late John Slagg and Mr. Smith to make the inquiries at Verviers, which was practically the centre of the woolen industry in Belgium. They were taken in hand by the Chamber of Commerce of Verviers, and by leading spinners and manufacturers, and most freely shown over their establishments. One of the things impressed upon them was that the Belgians had been very much in advance of the English in the use of carding machinery, had been in advance of them in the adoption of the self-acting mule, and, in fact, in advance of them in the use of machinery, which it was believed, had been invented in England. But there was another important point in which they were much ahead of the English, and that was in the treatment of "burry" wool. When in former days this wool was sold in Liverpool, spinners bought it, but they found that the burrs so impregnated the yarn and the pieces that it was impossible by the means at their disposal to extract them. So spinners gave up purchasing this wool, and thus threw upon the market an enormous proportion of most valuable wool through sheer ignorance of how to deal with it; the consequence was that they gave to the Belgians practically a monopoly.

There existed at Verviers a magnificent technical school, and Mr. Smith and Mr. Slagg found that the Belgians, from their chemical knowledge, had been able to destroy the burr and to extract it. Of the processes that they used, the English through their insular prejudices and lack of scientific knowledge, remained in ignorance for several years, and thus allowed this great industry to become centered on the Continent. Not only that, but the English lost the shipping trade, because it was found convenient to transfer the sales from Liverpool to Antwerp.

Mr. Smith related that he had had many conversations with the late Sir Isaac Holden on the subject of the burr, and Sir Isaac pointed out the folly of English spinners trying to insist that all wool from Australia should be free from burr. The plant which produced the burr formed one of the chief and best foods of the sheep in very droughty districts. The plant pushed its roots deep into the ground, and it was thus able to live and keep green when other vegetation was parched or dried off. Sir Isaac, among his inventions, brought out a "burring" machine, and it was remembered at the firm's works in France seeing the burr stripped from the wool, and how Sir Isaac was able by his wonderful combing machine to comb the wool which in previous times had only been carded.

Ohio Wool Growers.

At the January meeting of the Ohio Wool Growers' Association, the following resolution was passed:

Whereas, the prices of American wool in the Eastern markets of the United States during this year have been about three cents per unwashed pound less than the import price of similar wools, showing that combinations exist to fix prices below the real value; and, whereas, on Dec. 17, 1897, representatives of wool manufacturers in Ohio and six adjacent States, assembled in Columbus, to agree on modes of purchasing wools, evidently

showing a purpose to co-operate with other combinations to keep prices below real value; and, whereas, justice requires that wool-growers should receive the fair value of their wool; therefore be it

Resolved, that the president of the National Wool-growers' association is requested to call a meeting of said association at some convenient time, with a view to adopting measures to secure to wool-growers the just value of their wool, and for this purpose we recommend that arrangements be made by which wool-growers and local wool dealers can ship their wools to some principal wool market, where advances of money can be made thereon and where it can be held for sale at prices equal to its value, and in this we invite the co-operation and combination of all the wool-growers, local wool dealers and wool-growers' associations in the United States.

Wool in Smyrna, Turkey.

We have just received a communication from U. S. Consul, J. H. Madden, stationed at Smyrna, Turkey, on the sheep husbandry in the district about his consulate, which we publish, as below. Mr. Madden accompanied his letter with a sample of the growth of wool in his district. Mr. Madden writes:

In the province of Smyrna, there are about one and a half million of sheep. They are all of what is known as the "fat-tailed" variety. I never saw such sheep in America, except in Barnum's show. Every raiser owns flocks of from 50 to 700 heads. They graze on the mountains in winter and on the plains in summer. They are never fed as in America. Their food consists solely of grass. They are not housed in winter, but in summer they are kept during the day under a shed, covered with brush, to protect them from the burning sun. During that season they graze only at night. There are two shepherds employed with each flock, who remain with their herds day and night. Their wages run from $45 to $50 per year, including food and clothing. The yearly expenses for each sheep run from $1.50 to $2.00 per year, including a government tax of 22c. After deducting all expenses the raiser is supposed to realize about $1.50 net profit per head, which is obtained by the sale of the milk, the wool, or the sheep itself, for slaughter. There are two clippings of wool each year. The first shearing occurs in May; the second in August. The first yields from two to three pounds of wool per head, the second only one pound. The second clipping is of a finer quality and brings better prices. It is very rare that any wool is exported from Asia Minor. It is nearly all used at home for domestic purposes, or for making Turkish carpets. The annual clipping in this province yields about 300,000 pounds. As to the quality of this Asiatic wool, you can see from the enclosed samples. It is inferior to the merino in quality, and sells here at from four to six cents per pound. From time immemorial, the breed of the sheep in this part of Asia has remained unchanged, no effort ever having been made to improve it by the introduction of the merino or other fine varieties.

--A new method to waterproof fibrous substances, after dyeing, by treatment with a solution of aluminium acetate has been devised. Such solution is obtained by mixing separate solutions of sulphate of alumina (3 oz.) and acetate of lead (4 oz.) in distilled water, allowing to subside, and then adding tannin (¼ oz.), and again allowing to subside. The total amount of distilled water required for these quantities is one gallon. The fibrous material is dipped in the solution and then dried. It is claimed that the method of waterproofing makes the colors fast, and that the feel and finish of the fabrics—more especially of silk fabrics—is considerably improved.

--Red flannel is very popular with the Tuaregs on the Niger, who use it for making large square pockets which they sew on to their buttons or use otherwise for ornamenting their saddles.

KNITTING DEPARTMENT.

The Knit Goods Situation.

The knit goods salesman virtually scratches January off his calendar. As he expects nothing of this period, the statement that he is satisfied with his present trade, at this interval, is not likely to carry much weight. As a matter of fact, business thus far this year is fully up to the average, and but for the repeated mellow spells of weather this would have proved the best January for several years. The prevailing low temperatures have taken most of the gimp out of the heavy lines, such as shawls, skirts and hoods, while the same causes have operated to make sweaters and athletic goods indifferent, through the best period of the skating and winter outing season.

Indications point to an earlier spring call than usual, but that will not compensate dealers for the loss of a sizable fraction of their heavy goods trade, which is the chief dependency of the year. The Philadelphia and Baltimore jobbers have bought enough earlier than usual this year to make the operation marked. Their action seems based on the general judgment that prices are around the bottom. Everybody is just now busy preparing for spring trade and in hosiery uncommonly gay layouts are seen. It is surprising what varied samples of plaids are shown, considering that practically none of the small shops have ventured on them. The large stores, however, are handling them by the thousand dozens. Perhaps it is just as well that the small dealers have not yet taken hold, for the goods are hard to get, many jobbers picking plaids up in small lots wherever they can be obtained.

Printed hosiery is a conspicuous novelty. It offers a great range for effects, but many of the designs it must be said, are so poorly conceived and executed as to impress buyers most unfavorably, particularly when shown at the outset of a display of stock. Domestic manufacturers' copies of foreign plaids are anything but reassuring. They find it impossible, except at long notice, to get machinery capable of forming a graceful stocking, which is also passable from the fancy view point. The ankles are very little smaller than the legs, reminding one of a fat man's neck.

Stripes are gaining rather than losing in popularity, and in the spring and summer promise to be even more in demand, especially as Roman stripes in silk waists multiply. The western call for these goods is remarkably large, following the penchant of western folk for pronounced innovations. Cotton lines in spring goods manage to hold their own, in spite of the fact that some buyers are waiting, sure that the fall in cotton will eventually cause the cotton yarn combination to grow weak-kneed. It is difficult to get at the matter with any authority, but it seems, nevertheless, that the yarn combine must have a big stock of yarn piled up. On the other hand, the higher prices on wool goods is sure to transfer a certain amount of that consumption to mixed cotton and woolen goods.

The strike of operatives in the cotton cloth mills has no direct connection, but serves to cause apprehension in general trade. Several mills are in the market with quotations proportionately below last year's prices, but it is whispered that some of these at least, have reduced qualities to correspond. Evidently the stress of the last three years has taught many a manufacturer extensive theories of manipulation. Low and medium grade goods take about all the trade, outside a few of the finest lines. Fleeced goods, in view of the average temperature, have been in extraor-

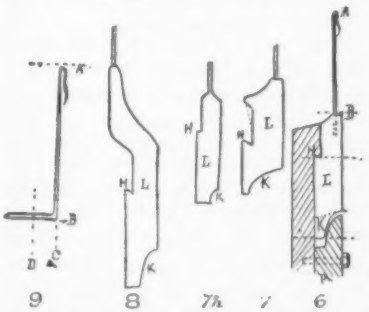
dinarily good demand. Evidently there are many buyers who think wool in any form is mighty good property, notwithstanding a wad of talk to the contrary. The mills are believed to be well supplied with cotton and wool. The knit goods combination of recent remembrance is not dead—only sleeping. Its members, more particularly its leaders, are rather mum, as might be expected at this period, but will be heard from again in some form, although not in the near future.

Hints on Practical Knitting.

J. H. QUILTER.

(Continued from January.)

Before treating upon all the various methods of effecting the motions by mechanical means referred to in my previous article, according to different principles of knitting, and noting at the same time, all the essential differences between perfect and imperfect knitting, it will perhaps be better to deal first with the needle, as without this, correctly fitted knitting can not



be made perfect, however well other parts may be manipulated. The make of the needle is the first consideration. It must be well made and properly tempered, for, in knitting with the bearded or spring needles, mechanical means are used to close the beard to attain the result shown at Fig. 4 (see January issue).

But when this is done, the beard, after the presser is released, must open again of its own accord, and if we will only consider the times in which this has to take place during knitting, if only for a week, it will soon be seen that the life of the needle depends on how long this can be accomplished perfectly. A beard, to remain down, allows all loops to pass over or to split on the end of beard, if they only partially rise.

Needles are fixed on the machines on two principles as shown at Figs. 7 and 3, the former being cast into leads and attached by such leads to the needle bar. One kind of lead is shown at L, Fig. 6, and other shapes at Figs. 7 and 8. Each of these leads on one machine should be of equal thickness, and the needle so fixed that the length from A to B may be alike in all. The leads all have two peculiarities; a lower projection to fix on needle bar, as shown at "H," which prevents a forward movement and a slope at the end "K," on to which needle plates, as "D," Fig. 6, are fixed, preventing any movement whatever. Whatever may be the shape of the needle leads, these two points are essential and will always be found. Unless a lead is perfectly secure, as well as level on all points, knitting cannot be done correctly.

On the principle as shown at Fig. 9, there is no such lead, but the shank of the needle is turned at right angle, with a perfect uniform distance from "A" to "B." The point "C" to "D" is cut as described; the end "D" being inserted into holes in the needle bar, and a needle plate fitted on top of the same, which keeps them perfectly secure.

The difficulty that has been experienced with this class of needles is that the shank requires softening in order to be bent as described, and if softened too much, however, the needle will bend out of its true line, while on the other hand if it is not softened enough, and is not of sufficient distance from end of the shank, it may break in bending. All these points require the utmost attention as it is in the details that lies successful production.

—Technical education is not unimportant from a purely utilitarian aspect.

Oil Spots on Underwear.

A short time ago I was called to a large knitting mill which had been in operation for nine years, to show them how to wash a very fine quality and grade of underwear, in both white and fancy colors, also cotton, silk and woolen mixtures. When I had been there a few days, I discovered some spots on two or three garments which to me appeared like oil spots. I asked the washerman where they came from. He replied, "I don't know, for it has been always so, more or less, and there is not near as many since you came," for I had him see that all shafting and drip pans around the fulling or washing mill, extractor, etc., were properly cleaned daily. So, one or two days after, when the goods were brought from the drying room, to the trimmer, I discovered on some fine white, all wool garments, a spot which, after testing, I satisfied myself came from oil. Showing the spots to the washerman, I asked him again where they came from. His reply was the same as before, adding, he had been very careful ever since I told him. So I told him it was my duty here to find out, and if he could not, I would, if possible. So I had each garment carefully examined before washing, for a few days, to satisfy myself whether they were all right thus far, for they might have come from the knitting frames, ribbers or seamers, and if the oil was not stainless, it would show.

The following day one or more spots occurred again. I at once saw that all things were properly cleaned, and started on a search to find out where the spots came from which had caused all this trouble. I had not long to wait, before I discovered whence it came. I will give a simple illustration how it occurred and escaped discovery, for there may be others who may be troubled in like manner. The extractor was driven from a counter shaft in close proximity to the wash mills, being placed there for convenience and saving of labor. As there were no self lubricators on the counter shaft, and few on the main, the shaft had to be oiled daily with an oil cup attached to the end of a stick, which is poor practice, because of the great waste of oil if nothing more.

After the shaft was oiled, I observed the oil working out of the hanger box, making its way gently along the shaft, until a heavy drop formed and fell. Instead of dropping into the drip box or pan, the oil was drawn, by suction, so to speak, into the rapidly moving belt that operated the extractor, and thus carried to this machine and deposited on the goods therein. As soon as I discovered this, I had the carpenter make a light frame of wood covered with tin, and suspended it by a light rod of iron at each corner within a few inches of the shaft, so that when the drop would fall the current or suction from the belt could in no way affect it.

Oil spots from shafting bearings are very difficult to remove, and when a dull or heavy yellow spot is seen on underwear after it has been washed, you may rest assured that it is from dirty oil, and hard to remove.

A. SCOTLAND.

Chemnitz.

THE HOSIERY INDUSTRY—FANCIES—UNDERWEAR—A NEW IDEA.

Business is by no means so bad as it might have been had not some happy-headed fellow suggested fancies. These are going as fast as frames can turn them off. The supply cannot keep up with the demand. Continental, that is, German, French, Swiss and Belgian buyers are ordering fancies, also. It is plaids, plaids and Roman rings. Even France has been unable to resist the present rage for fancies in plaids, rings, etc. Anything goes, although the French and Parisian taste has taken kindly to the softer and more subdued colors and effects. It is very funny, this finding French buyers in the Chemnitz market. Report has come to me of a French hosiery mill going to the United States. Rumor has it that a Chemnitz concern has eyes on a United States plant for a hosiery mill. England, that orders

hosiery here by the hundreds of dozens or thousands formerly, is now ordering in very small quantities. Of course a good deal goes to the colonies. Saxony is beginning to supply Canada, Australia and other British possessions. Canada sends her hosiery buyers here, as regularly as does the United States or England herself.

The states of South America were wont to buy in fairly big quantities, taking, as a rule, rich fancies. Now no one is ordering in anything like the old-time quantities; why, no man knoweth. Some say it is due to the disturbed condition of South American politics. My own idea is that South America is beginning to buy elsewhere. Chili, Brazil, Venezuela, etc., were good customers, for they had a weakness for fancies when others were buying blacks. Now, luckily, it seems to me, though manufacturers here don't think so, South America's buyers are holding off when fancies are at a premium. How, under heaven, manufacturers could hope to furnish half enough fancy hose, had South America been buying in large quantities, is more than I can make out.

The United States are now, as they have been for half a hundred years, the best and biggest buyers in this market. One New York house keeps two concerns here, going all the time. The orders they get, or got formerly, from others, take little or no time to fill.

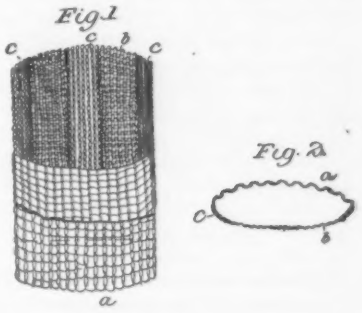
Articles in underwear were never nicer, never so neat, never better made and never so cheap. Prices for cotton, silk, half silk, woolens are so low that one wonders how it is possible to pay living wages and dividends. Of course wages are not high. They are hardly half, if half, what they are with you.

A new idea, two or three years old now, the invention of a locomotive engineer in Bavaria, one Weber, is to revolutionize (?) the underwear trade. His invention consists of a cloth, made from linen and woolen, woven or knitted together in meshes, that the linen lies close to the skin, takes up the sweat and passes it on to the woolen exterior. It works equally well with silk. Samples were sent to the States some time ago. How well they went I am not able to say. One Gotthilf Langer has the exclusive right to make these goods. The inventor claims that it is as good in winter as in summer, that it helps to develop a healthy tone in the skin.

Knitting machines are going to the States, to Austria, and Bohemia. All eyes are turned longingly towards the United States. Machine makers as well as hosiery knitters look to America for markets such as no one other nation offers.

Knitted Fabric.

We illustrate, herewith, a newly devised knitted fabric in a tubular form, having an open texture knit in large stitches on one side or half of it, that will allow fluids to penetrate to the inside of the tube readily and have the other side or half of the tube knit with a fine close stitch to prevent the exit of said fluids, and one or more closely knit ribs running longitudinally of the tube to prevent the fabric from stretching and closing up the



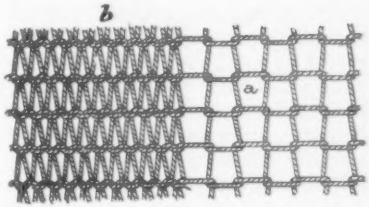


Fig. 3.

openings between the stitches on the front side, and to better preserve its shape when in use. This purpose is accomplished by knitting one half of the tube "a" or half-way around with large stitch to make it very open, and knitting the other half of the tube "b" of a quite fine stitch, which will not readily allow a comparatively thick fluid to pass through and which from the close order of the loops laterally will not allow the fabric to stretch lengthwise, and so close up the large open loops "a" on the front and render the fabric useless for making bandages.

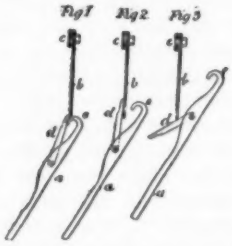
In Fig. 3 the course of the thread is seen when the fabric is knit on a circular loom as it passes from the front to the back. In the back half "b" the needles are placed as close together as may be and in the front part the needles are placed wide apart to make a wide open stitch "a." To still more limit the stretch of the back and make it seem thicker, ribs "cc" may be made as is usually done on plain knit fabrics. To do this, a dial is used containing for the side "b" the groups of needles necessary to form, in combination with the cylinder-needles, the ribs, as may be desired.

This invention relates to a class of tubular knit fabrics employed for bandages.

Latch Needles.

There has recently been offered upon the market, in England, a new latch needle for knitting machines, the object of which is the production of an improved latch opener. We have thought that our readers might be interested in this needle, and, therefore, illustrate it, herewith.

In one arrangement, particularly applicable to machines in which the needles move the least possible distance—that is, until the loop is clear of the latch,—the needles "a," which may be of any of the usual kinds, are supposed to move for knitting in the direction of their length, while the latch opener "b," placed at or about the angle shown with regard to the needle, is fixed to the bar "c," which is supported in any convenient manner by the machine. In Fig. 1 the needle is shown in contact with the opener, which is struck by the end of the latch "d" as the needle moves formard, and is turned on its axis until the hook "e" is fully opened, as shown in Fig. 3. In another arrangement the latch opener is so fixed that it is practically in the same plane as the needle. With



this arrangement the latch opener is struck by the needle hook when the latter has risen high enough for the loop to have passed over the latch, and the needle has an increased movement by which the latch is opened, if by any means the needle is without a loop. With this arrangement the needles are fed as they descend. In another arrangement applicable to machines in which the needles are brought to rest with the loops on the latches after each course knitted, the latch opener herein described may be moved to the needles for opening the closed latches, and from the same during the actual knitting of a course.

From Chemnitz.

As ever, the United States are buying the biggest quantities and placing the biggest orders for hosiery. Fancies are going as in the hundred days since September 1. Need I say that it is Scotch plaids?

Orders have been booked for fancies so big that one has to wonder how they are to be filled. Of course I mean those to be delivered before April. Orders, on or for June or July delivery are all right; but most buyers want early deliveries. All this goes as a good sign. Manufacturers see in it the certainty of fancies holding on for a long time in America. One can count little on such lively colors in

conservative countries. As it is, France and all Europe, although taking fancies, as plaids, roman rings, etc., ask invariably for soft, subdued colors. Some build on a much bigger business next spring, in fancies. I hope so. I certainly hate to see anyone's hopes disappointed. If I may say my say, it is that the fancies are going too furiously.

Prices run high. No kind of a fancy half hose runs under a dozen marks per dozen. Fair grades sell for 15 marks. Ladies goods go comparatively higher. Profits may not be huge but they are satisfactory. The 5-20's and, in some cases, 5-50's have been forced down to 4.30 to go in under the dollar limit of the tariff. This too was bona fide, as far as I can find out. Seven to eight mark goods, in some cases, are squeezed down to go under the $1.50 limit.

Sporting goods, that is, golf and bicycle hose, are going as fast as manufacturers can finish. There are some very nice novelties. Big orders for these goods have been booked by almost every house that has been able to guarantee delivery. The best buyers and best makers are doing all they can to take and put up only very nice goods at very nice prices. Orders given are for fine goods at high prices. In a few days I expect to see cheap imitations, for imitation is as much a part of this people's education as is originality. I heard a day or two ago that parties were going for patent rights on new textile ideas. By the way one Weber of Crailsheim, in Bavaria, has succeeded in finding a most excellent article for hygienic underwear. Jaeger's success set all Europe investigating. Weber's invention is the result of half a hundred experiments. My impression is that it grew out of his work as a locomotive engineer. He wanted to find something to keep him and his colleagues from catching cold, something that would take up the sweat, carry it away, leaving the body dry. He hit upon silk and linen or wool and linen. He prefers the former. This did, and does, all that any engineer can desire. It protects the body and produces a pleasant, rather than unpleasant effect.

C. J. BROWN.

Circular Knitting Machines.

The term knitting machine is somewhat distinct from the older machines used in the trade, known as stocking frames, or circular frames. The chief distinction may be due to their origin. The earlier class of machine being English, and the more modern of American production, each of which have, in the main, a principle distinct from the other by the fact that the English Circular Frame has a revolving needle cylinder and stationary cams, the needles in revolving traveling over these cams so shaped as to give them their desired motion, while the American Circular knitting machines have a stationary needle cylinder with a revolving cam ring, the cams in this ring giving action to the needles as they pass them in their revolution. The difference of these two principles gives the latter the more adaptability for a reversing or reciprocating motion, which enables a circular or selvedged fabric to be made on one machine, so that, whereas the English principle allows only of circular fabrics being made, the American principle makes a machine capable of producing a finished stocking or sock; this is the difference claimed by one authority in the two machines.

These circular knitting machines with stationary needle cylinder and revolving cam ring may be divided into two classes: plain and rib machines. Each of these may again be divided into: hand or power machines and automatic machines.

Some explanation of these two kinds will be necessary. A hand machine requires all movements to be performed by the operator; a power machine has its driving motion obtained by the usual mechanical means, all other movements being performed by the operator. The automatic machine being so called because all movements required during the making of an article are gone through by means of mechanical movements produced systematically from the prime or rotary movement supplied for the driving of the machine. From these are derived the terms ½-automatic, ¾-automatic, and ⅞-automatic, according to the de-

gree of the required operations that are performed by mechanical means.

Knitting machines are built in various sizes and gauges according to the diameter of the needle cylinder and the number of needles capable of working round such cylinder. In measuring circular knitting machines always take as the measuring point that at which the stitches are formed. For the diameter of a machine with perpendicular needles measure from back to back of the needles, opposite each other. To find the circumference from a known diameter a simple rule is to multiply the diameter by 3 1-7, or 3.14, thus reducing the circle to a straight line.

To find the gauge of a machine, divide the number of needles by the circumference or length in inches.

Circular knitting machines may be said to be built in four gauges, fine, medium, coarse, and extra-coarse, though others are constructed as required. These are represented by the following needles in a 4½-inch cylinder:

Extra-coarse, 60 needles in 4½ in., or about 4.25 needles per inch.

Coarse, 84 needles in 4½ in., or about 6 needles per inch.

Medium, 120 needles in 4½ in., or about 8.5 needles per inch.

Fine, 144 needles in 4½ in., or about 10.2 needles per inch.

The following tables will show the corresponding size of machines of the same gauge:

Extra-coarse gauge.

84 needles	5¼ in. dia.
72 needles	4⅞ in. dia.
60 needles	4½ in. dia.

Coarse gauge.

84 needles	4½ in. dia.
80 needles	4¼ in. dia.
76 needles	4 in. dia.
72 needles	3¾ in. dia.
68 needles	3½ in. dia.

Medium gauge.

120 needles	4½ in. dia.
114 needles	4¼ in. dia.
108 needles	4 in. dia.
102 needles	3¾ in. dia.
96 needles	3½ in. dia.

Fine gauge.

144 needles	4½ in. dia.
136 needles	4¼ in. dia.
128 needles	4 in. dia.
120 needles	3¾ in. dia.
112 needles	3½ in. dia.

—[Knitters Circular.

From Leipzig, Germany.

SKILL AND ECONOMIES.

The American knitting operative stands in need of the skill and tendencies that the people of Saxony have inherited, whose fathers and mothers for a hundred years now, were knitters. Boys and girls go into the knitting business here before your boys and girls begin to go to school. The house industry was here before Goethe was born. Children aid before they go to school and as soon as they get home. In this way they develop a dexterity due only to long years of experience. Besides, the help here even when not the children of knitters, are the children of textile workers. Time has done much to help the people to be skillful and particular. The captains of industry are wonderfully well-trained men. They know what they know, well, and from A to Izzard.

Wages here are not a good half what you give. Of course, product against product, girls and boys get nearly as much; but you cannot compare well, as you do not produce the higher grades; and it is on these that the skilled labor gets in its work. Your people are clothed better, eat better, live by all odds a great deal better than do the working classes here. The difference in wages is certainly a prominent factor in aiding this Empire to produce cheaper than do your manufacturers. Girls get here $1.75 to $4 a week. With you on similar work, girls would get $4.00 to $8.00. It is hard.to tell just what factors help here most. You have no help just like the help here in any part of your country, except in the cities whither Nottingham and Chemnitz emigrants have gone.

It is in its economies, its saving ways, that the Empire beats the United States and England. There is an absence of superintendents, overseers, second and third hands, there is a mechanical director and a financial director. Under these are technically trained fixers, men who know the ma-

chines as surgeons know the anatomy of human beings. Nothing that contributes to these economies is ever neglected. Herein is the first great factor. You have nothing and know nothing of such economies. It is time that you began to build up a similar system. It is in lots of little things that success is secured. It will take a long time to get your people to go over from the extravagant habits of half a hundred years to habits that have in themselves something totally antagonistic to what they have been accustomed. I am pointing out these economies; I am urging their adoption I do not know that you will be able to succeed in six months; it may take a century; but, what I do know is of the necessity to begin.

Leipzig, Germany. OOM PAUL.

Weight of Yarn.

Below is a method for ascertaining the net weight of a case of yarn or cops. Count the layers, and number of cops per layer forming the top surface. Next remove the end layer of cops except one; the second layer downwards except two; the third except three; and so down to the bottom. See how many layers deep and count the total. Then weigh a number of cops, with an equal number of empties in the scale against them, and calculate the net weight of the whole. In this manner, the weighing of a case of, let us say, 10 layers of 20 each, and 20 deep, or 4,000 in all, involves the removal of but 210 cops, and the case may be removed with its contents undisturbed.

To verify the condition of the yarn as it arrives, weigh a sample lot and place in a heated room. In a few hours it will lose not only all excess of moisture, but dry up below the normal hydrometric standard of 17 per cent., as allowed by conditioning houses, or 18¼ per cent. as granted in the trade. Then remove to an ordinary temperature. In 24 hours the yarn will receive its normal condition and the weight should correspond with that first ascertained. To ensure continuance of regularity in quality, count, etc., of course work up a sample, and ticket for future reference.

—There was recently opened at Leicester, England, a new municipal technical art school, in which there is a department devoted to instruction in hosiery and knitting. At present, this department consists of two rooms, one for the machinery, and the other for class purposes. J. H. Quilter, whose name and articles are familiar to our readers, is an instructor in this branch of technical education. Classes, as at present constituted, receive their instruction during two evenings of the week, one evening being devoted to the elementary course and practical demonstration, and the other evening to the more advanced grade, including practical work.

—The old race of designers were quite as ingenious in putting together a cloth as those of the present day. Their handiwork, as it exists in the fabrics which they invented, shows them to have been craftsmen of no mean order in constructing sound, salable, and varied textures in the most elementary weaves.

—The letters A. P. A. appearing on a number of cotton bales that were received at Fall River recently, were the occasion of a partial boycott of the bales, by a number of the wharf employees, they mistaking the letters to refer to a recent political organization, now generally considered defunct. After satisfactory explanation that the letters did not refer to anything, more than they were a special mark indicating a lot, no further trouble regarding their handling was experienced.

—Delicacy of tone should be sought after and all color compositions very carefully graded, while the range of colors in all tones should be judiciously extended, so as to commence with a very dark shade and work upwards by easy stages to a tinted white, the utmost care being exercised to have all shades in the range perfectly harmonious and analogous.

POWER DEPARTMENT

O. R. YOUNG, M. E., Editor.

Chalk Talks.

BRACED AND STAYED SURFACES.

Several inquiries having recently come in asking for a simple method for calculating the proper size and number of braces to support a given area. It has been assumed that the subject is of sufficient interest for a Chalk Talk.

It is well known that all surfaces of steam boilers which are liable to a change of form when under pressure, require to be fitted with a system of braces or stays to resist this tendency.

In the case of a horizontal tubular boiler, Fig. 1, that surface of the boiler head represented by the area enclosed within the dotted lines would be forced or bulged outward by the internal pressure, were it not for the braces and stays applied as shown in Figs. 2 and 3.

Fig. 2 shows the diagonal braces from the head of the shell, and Fig. 3 the method of staying (which is adapted to boilers carrying high pressures), by the use of stay rods from head to head.

There seems to be several advantages in favor of making the number of braces small and increasing their size or area correspondingly. The boiler is thus rendered more accessible for cleaning; the circulation is less obstructed; it is much easier to give a smaller number of braces an equal tension, and larger braces are relatively less reduced in area by the same amount of corrosion than the smaller ones.

There is, of course, a limit to this spacing, depending upon the thickness of the plate and the steam pressure carried; to prevent this the plates are re-enforced by angle or Tee irons to which the braces are attached.

Rule. To calculate the number and size of braces for the surface within the dotted lines of Fig. 1, multiply the area in square inches by the steam pressure, which will give the total stress upon the unstayed surface of the head. Call this Product 1. Multiply the cross sectional area of the brace in square inches, by 6,000, if of iron, this will give the stress in pounds to be allowed on each brace. Call this Product 2. Divide Product 1 by Product 2, the quotient will be the number of braces of that size which will support the surface.

This is for a direct, straight away pull; for diagonal braces the area will have to be increased in proportion to the angle which they form with the stayed surface.

Chas. H. Haswell gives the following rule for diagonal or oblique stays, viz., "Ascertain area of direct stay required to sustain the surface; multiply it by the length of diagonal stay, and divide the product by length of a line drawn at a right angle to surface stayed, to end of diagonal stay, and quotient will give area of stay increased to that which is required."

For example: Assume the area within the dotted lines, Fig. 1 to be 750 square inches, and the steam pressure to be 100 pounds, then as per the rule 750×100 equale 75,000 pounds, which will be the total pressure to be sustained by the braces. If, for instance, it is decided to use 1¼ inch braces, the cross sectionel area is $1\frac{1}{4} \times 1\frac{1}{4} \times .7854 = 1.227$ square inches. $1.227 \times 6{,}000$ equals 7,362 pounds to be carried by one stay.

Dividing 75,000 by 7,362 gives 10 with a little over, thus to be safe we would use eleven 1¼ inch brasses for direct staying.

If these braces are to be placed obliquely or diagonally, the length of the brace must be found, each one being calculated separately, as they will vary in length.

In the case of long brace A, see Fig.

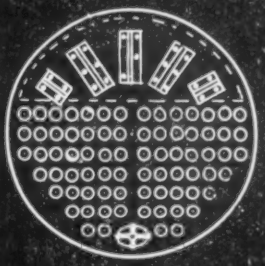


Fig. 1.

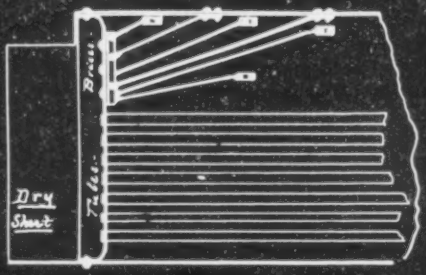


Fig. 2.

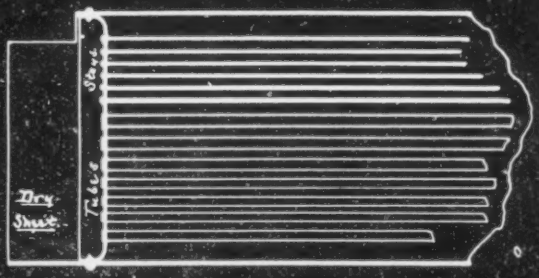


Fig. 3.

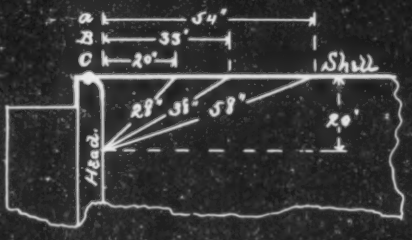


Fig. 4.

4, it will be seen that the diagonal or brace is 58 inches long and is connected to the shell 54 inches from the stayed surface, thus as per the rule, 1.227 (square inches of 1¼ inch brace), times 58 = 71,166; dividing 71.166 by 54 equals 1.317 square inches which would be the proper area of an iron brace placed at this angle to sustain a stress of 7,362 pounds.

In the case of the shortest brace, C, see Fig. 4, by the same rule (1.227 × 28) ÷ 20 equals 1.717 square inches which would be the proper area of a brace placed at this angle to sustain the same stress as the other braces, or 7,362 pounds.

Modifications in Mill Design Resulting from Changes in Motive Power.

Abstract of paper read by Stephen Greene, Boston, Mass., at the October meeting of the New England Cotton Manufacturers' Association.

For the purposes of this paper the history of mill designing may be divided into three general periods. These divisions may not be so clearly marked as to stand out distinct from each other. On the contrary, from the nature of circumstances, they run into and lap over each other, but still the division may be made in a general way.

The first period may cover the time from the beginning of the factory system in this country up to the time of the general introduction of the modern automatic cut-off steam engine, which date may be placed about 1860.

The second period may be taken as extending from the date just given to about 1893, when electric transmission began to be seriously considered in the driving of textile mills.

In the first period water power in its various stages of application was the ruling factor in motive power for textile mills. In the second period the steam engine disputed the sway of the water wheel and succeeded in taking the primary rank. We are just upon the threshold of the third period, and a large part of what may be said must be regarded in the light of prophecy, and not history.

In the early days of the factory system the water power was in a large degree the controlling factor. The mill was located with reference to the water power, and the particular development of the power in hand controlled in a very large degree the design of the mill structure.

The introduction of the modern turbine wheel, together with the demand for larger plants, marked a step in advance in mill design. It was found possible to place the wheels in such a position as would best suit the peculiar development of that power, and then to transmit the power through gears and shafting to some central point of distribution in the mill.

With the advent of the automatic cut-off steam engine, with which the name of Corliss is indissolubly connected, the field was opened for a still further modification of mill design.

It was no longer necessary to select a site by the river bank where the topography was more characteristic for its beauty than for its utility, but a spot could be chosen where a mill could be built much more economically, and where the requisites of light and ventilation could be met in a much more satisfactory manner.

It may be stated at this point that the improvement in water wheels, and the adoption of horizontal wheels has rendered possible, in the case of water power mills, a proportion at least of that freedom in design which is more characteristic of the steam power mill.

The horizontal wheel with the draft tube, enables the mill engineer in many cases to place the wheels where the best results can be obtained, and at the same time with slight loss in transmission of power place the building on a much more desirable site for the mill than was possible where the old type of wheels was used.

The improvement in water wheel design has furnished opportunity for a greater freedom in mill designing, in some cases approaching that of a steam power mill.

The introduction of the electric generator and motor made a complete revolution in the design of textile mills.

At last it seemed possible to select a site that should be most convenient for

the essential requirements in manufacturing, viz., the securing of labor, raw material, and transportation of the finished product at a minimum of cost, and to erect a building that should be exactly adapted to contain required machinery, arranged in the best possible manner to fulfil its functions.

The possibility was seen and recognized long before the actual realization was possible, for while it was theoretically possible to transform the mechanical energy of a water power or steam engine into electric power, and then conduct this power through copper wire to a motor located at the point of distribution of power, the cost of such apparatus, together with the large loss in transmission, was an effectual barrier to prevent its adoption in any large degree.

Fortunately, the study of electrical transmission, and the perfection of the apparatus was entered upon and pursued with such perseverance and success, that we have already reached the point where it is not simply theoretically possible, but practically advantageous in many cases, to locate the mill at the best possible point as concerns the design of the building and the organization of the machinery, and utilize the power at any considerable distance from the mill. It can hardly be claimed with justice that at the present time the electric transmission of power has reached such a state of development that it is applicable in all cases. It is undoubtedly true to-day that if a site could be selected and the source of motive power, either the water wheel or the engine, so arranged that the power can be transmitted from the wheel shaft or the engine shaft, as the case may be, directly to the main shafts in the various departments of the mill, that no saving either in the first cost of installation or the economy in running would be experienced by substituting electrical transmission for mechanical transmission.

While this is true so far as a textile mill is concerned, where the load is practically constant throughout the sixty hours of the week it would not hold in the case of manufacturing plants of other types where the load was not constant, and where different departments are likely to be run with varying loads and at different times. Under such conditions the time for the adoption of electrical transmission has already come.

There may also be cases where existing plants are so scattered, covering such an area, that no central power plant can furnish the power with mechanical transmission, with any good degree of economy, that electric transmission is practically applicable.

In view of the remarkable advance that has been made in a very few years, it is not difficult to imagine that before many years have elapsed it will be perfectly practicable and a positive advantage, even though the site may allow placing the motive power immediately within the building, that the power shall be transmitted to the various parts of the building by electric transmission, thereby modifying in a marked degree, the design of the mill organization.

It is not claimed in this paper that at the present time electric transmission is universally applicable, but it may be claimed with propriety that under certain conditions the advance in the manner of transmitting power has made it possible to exercise much greater freedom in designing and organizing the modern cotton mill.

The Proper Construction and Uses of Economizers.

The principle of heating the feed water in a separate vessel, quite apart from the boiler, and thereby utilizing the heat in the waste gases, is the function of flue heaters, more commonly called "economizers," leaving the boiler to supply chiefly the heat units necessary for the latent heat of steam. Taking the important steam users throughout the world, this is a recognized and universally adopted practice.

The great loss of fuel as noted between the heat value of coal and the heat taken by the water, has been observed for many years, and numerous have been the appliances to recover it, the simplest and best method appearing to be to pass the waste gases on

their passage to the chimney through pipes containing water.

The failure of many flue heaters is attributed to three causes:

First, Not being made of cast iron, the only practical metal to withstand the corrosive action of sulphurous gases.

Second, Lack of capacity. It takes time to absorb enough heat to make them of practical value, hence the water should be from thirty to fifty minutes surrounded by waste heat.

Third, Lack of automatic cleaning of pipes. Soot being a non-conductor of heat, a slight coating on a limited capacity economizer would end its usefulness in a few hours after it had been thoroughly cleaned.

The most important details for a well designed economizer should be the absence of all "made" or packed joints inside of the brick work; easy accessibility to every square inch of internal surface; the vertical pipes should be forced into the top and bottom headers by powerful hydraulic pressure, making the joints metal to metal, which is a far superior piece of workmanship than fitting the pipes in loosely into the boxes or headers and then rusting in by the use of iron filings and salammoniac; and finally, applying a rigid test to each section of 350 pounds to the square inch.

A well constructed economizer built under the specifications described, should last twenty years, under ordinary care and attention. After it has reached that age it can be easily repaired and parts renewed so as to last indefinitely, as an umbrella retains its orginal individuality which has been fitted with new stick, spokes and recovered.

The care required consists in blowing off daily at the same time as the boilers. Every three months the soot should be cleaned out of the chamber below. Once a year, at least, the caps should be taken off and the interior of the pipes inspected. If the water is bad this should be done oftener.

The advantages of the economizer may be summarized as follows:

It is a genuine saving of fuel expenditure by recovery of heat otherwise totally lost; it increases the capacity of the boiler plant; it saves repairs to the boilers by relieving them of much of the strain of expansion and contraction caused by colder water entering the boilers and mingling with the hotter contents; it prolongs the life of the boilers for the same reason; it saves much cleaning of the boilers; and is especially desirable where the work fluctuates.

Any use hot water can be put to in processes of manufacture can be obtained free of cost by drawing the pure hot water from the economizer; particularly bleachers and dyers take advantage of this opportunity for their kiers and dye tubs. Where mills are heated during the winter by hot water, a part of the economizer can be included in the circulating system, supplying the heat necessary, entirely by the waste gases.—[H. G. Brinckerhoff.

Running Without Oil.

There is no more disputed question than that of the possibility of running a steam engine without oil, says the Electrical Review. We believe that the difference in opinion is entirely one of practice, that differences in practice cause the various behaviours upon which this man or that man bases his opinions.

Every practical man knows how, in the case of a piston valve, for example, it is necessary to put in a fair supply of oil so that the rubbing surfaces may be well coated with oil just at the last few revolutions of the engine, if there is to be a stoppage of several hours' duration.

We have a keen remembrance of a neglect of this simple precaution which caused the doubling up of the valve rods when the engine was started after a thirty hours' rest, entirely because of the setting fast of the piston valves which arose from the oxidation of bright wearing surfaces that should have had an oil coating just at stopping.

So long as an engine is running it will do. at least if it be a vertical engine, without oil, and the working

surfaces of the piston and cylinder will work to an excellent water polish surface.

The water polish will differ from that brought about by oil. The finish of the surface will be different; there will be a different skin upon the surface from that which is secured where oil is employed. If, then, such good results follow upon the use of water lubrication, how is it, we may ask, that all cylinders cannot be so run?

We are not here discussing the question of net cost, but of convenience and possibilities. The answer given to this by a prominent engineer to whom we recently addressed the question, was in effect that having got your water surface you must keep it.

Now a water surface cannot be kept in order unless it be kept bright. It cannot be kept bright if allowed to be idle for any length of time. If allowed to stand many hours at rest the bright surface will rust. If it rusts, the polish is gone, and the piston, if it do not set fast, will score the surface, and there will be wear and tear and much groaning, and the end will be that oil will be resumed. It may be argued: why not supply oil for the last few minutes of a run? The answer to this is, that a water polish differs essentially from an oil polish, and if a water polish be lubricated, and the surface examined with a microscope, the molecules of the metal will "stand up and look at you," proving that the old surface has gone, and a new surface is now being formed, and when the oil surface has been formed, the water polish when re-formed will begin by the same uppish behaviour of the surface molecules, and all the difficulties will thus recur at every change of regime.

The fact is, one cannot play fast and loose with the working surfaces of a steam engine. Either they must be oiled when they may be alternately worked and stopped for hours at a time, or they may be run with water only, but must then be run practically continuously—so continuously that any stoppage must be for so short a duration as not to allow sensible oxidation of the brightened surfaces to take place.

As regards the actual economy, it is not easy to say much. To run without oil saves the cost of the oil. This is an obvious truth. But is a water friction greater than an oil friction? We feel sure it would be greater in a horizontal engine. In a vertical engine with less ring pressure, and an absolutely weightless piston there is, or need be, very little piston friction, and it is quite possible that the thin lubricant—water—will prove as good as a more full-bodied oil. But it may be that the saving in oil will be more than counterbalanced by the extra fuel absorbed in overcoming extra friction.

Oil has other disadvantages than mere cost. Mere loss by friction may be more than counterbalanced by better vacuum. An oilless cylinder will show a cleaner surface condenser, and, moreover will enable the condensed steam to be used again and again in the boiler without danger or trouble from burning of the plates through floury deposit and its dangerous compound with grease so well known. The pros and cons of the question are very numerous. We think most engineers in charge of steam power would wish to run without oil, especially where waters of an encrusting nature are employed. But oilless running has not yet seemed to be possible where there are several hours' interval of rest between periods of running.

Then, again, the oil question assumes an importance in view of superheating—whether will oil stand the superheat or the cylinder stand the dryness? A considerable superheat might even deprive the cylinder of all its water lubrication. From observations made there would appear to be difficulties when a cylinder altenates between superheated and wet steam. The change of regime possibly again explains this. To use the words of the engineer above referred to, the surfaces stand up and look at you, and they cannot endure a change from dry to wet any more than from wet to oil.

There is more in this question of cylinder lubrication than is usually suspected, but so far as we can gather, the success or non-success hangs upon the regularity of whatever system is pursued, and the continuity of running where a water surface is required. It would seem likely that for ordinary periodical working without oil, success might, perhaps, be secured if hot dry air could be circulated through the cylinders, and the engine could be maintained in a state of slow rotation for a sufficient time after ceasing work to allow such heated air to carry off every particle of moisture.

The polished surfaces would not oxidize in a dry atmosphere. This with perhaps the use of a little of the finest levigated plumbago might perhaps solve the difficulty

Hand Loom Weaving in the United States.

There is comparatively little cloth hand weaving done, at present, in the United States, except in some sections of the South, and in places largely settled by foreigners. Domestic manufacturing consists almost wholly of the manufacture of rag carpets and rugs, made from old ingrain and Brussels carpets, though there are frequently found hand weavers manufacturing fly nets, hammocks, etc. There are, as near as can be estimated about 50,000 hand weavers in the United States, or about one weaver to every 1,400 or 1,500 inhabitants. The greater portion of this weaving is done in the Middle, Southern, and Western States, and of these sections, the Middle State have probably the largest number of hand looms. The great reduction in the price of power-loom carpets has somewhat crippled the rag carpet business, but, of late years, a demand has sprung up for rugs made out of these worn out carpets. Large hand rug factories are being established in many of our Southern and Middle States, and it is the opinion of some good judges that the day is not far distant when the rug industry will be quite generally taken up in all of our Northern States.

There are but few factories in this country where rag carpets are woven on power looms. The rags made from old, worn-out carpets must ever be woven on hand looms. The ruling price for weaving rag carpets is 12 cents for what is called "Hit-or-Miss" and 15 cents for striped carpets. Where the weaver furnishes the warp, the price isf rom 20 to 30 cents a yard, according to the amount of warp used. The ruling price, as near we can ascertain, on rugs, seems to be $1 a square yard for cutting, raveling, furnishing warp, weaving the rugs, and finishing, ready for the floor. The spinning wheel is mostly used by foreigners, and there is quite a trade in them. We are indebted for the foregoing data to the Eureka Loom Company, manufacturers of rug and carpet looms, Battle Creek, Mich.

—The most important use hitherto made of mercerization is for "crimping" cotton cloth, the processes employed being now so generally known as not to need recapitulation. Whilst the effect is here attained by the local application of alkali with rollers or with the help of reserves, for the close imitation of crepons no such contrivances are necessary. All that is needed is to subject a fabric woven of cotton, with wool or silk yarns, to the action of the alkali at a low temperature calculated to protect the animal fibre. To obtain good effects the cloth has, however, to be suitably woven. The cotton threads may form part of the warp only, or they may be present in both warp and weft; in either case they must be both suitably proportioned and properly placed, to achieve the object.

—We notice that a new process has appeared for giving a silk like appearance to cotton. The yarn is treated in cold caustic soda at 45° Tw. until complete impregnation has taken place. It is then wrung out and hung on drying reels, which are so arranged that during the drying a strong stretching of the yarn can be given. When dried it is washed as usual. It is claimed that this process is simpler than the process of mercerizing under tension, and that it gives good results.

COLORS AND DYEING.

Dye Recipes for February.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $3.

RECIPE NO. 17.

Light Blue on Cotton Yarn.

Direct Indigo Blue B N on 100 lbs. cotton yarn.

Prepare dye bath with

½ lbs. Direct Indigo Blue B N
(A. Klipstein & Co., 122 Pearl St., New York.)
15 lbs. Glauber's Salt.
2 lbs. Sal Soda.

Enter in yarn at 140° F. Bring to boil while turning, and turn to shade at that heat.

Direct Indigo Blue B N is a very soluble powder, and for light and dark shades it works very level and slowly on the fibre. It will combine very well with the benzo and diamine colors. (See 1897, recipe 191 for another shade of blue from this dye.)

RECIPE NO. 18.

Dark Blue on Worsted Yarn.

Extract Logwood N on 100 pounds worsted yarn.

Prepare dye bath with

6 lbs. Solid Extract Logwood N.
(Stamford Mfg. Co., 133 Front St., New York.)
2 lbs. Oxalic Acid.
2 lbs. Copperas.
1 lb. Blue Vitriol.
½ lb. Acid Violet 6 B.

Enter in yarn at 160° F., bring to boil while turning, and turn 1 1-2 hours at that heat.

A fine dark and evenly dyed blue is shown here, dyed in a quick and cheap way. The color is fully equal to a mordanted blue, besides being quicker handled. The shade is just as fast, and the yarn is left in a soft and pliable condition. (See recipes 60, 71, 100, 124, 134, and 180, of Extract Logwood N, used alone and in combinations; also recipe 2 in the January Supplement, showing a like combination to the present one for a dark blue.)

RECIPE NO. 19.

Green on Woolen Yarn.

Green No. 1 on 100 pounds shoddy and wool yarn.

Prepare dye bath with

1½ lbs. Green No. 1.
½ lbs. Acid Black B.
(Anchor Color Mfg. Co., 462 Cherry St., New York.)
10 lbs. Glauber's Salt.
4 lbs. Oil of Vitriol.

Enter in yarn at 120° F., bring to boil while turning, and turn to shade at that heat.

We have shown dyeings in previous Supplements of both Green No. 1 and Acid Black, but they were dyed separately. We now show a combination of both dyes, and the shade produced is very fast and cheap. A number of green shades can be dyed by using different amounts of these dyes. (See recipe 110, in our last July issue, for a green from Green No. 1; recipe 128, in our last August issue for a black from Acid Black B 4; and recipe 8, in our last month's issue for a black from Acid Black B 4.)

RECIPE NO. 20.

Bright Red on Worsted Yarn.

Acid Magenta on 100 pounds worsted yarn.

Prepare dye bath with

2½ lbs. Acid Magenta.
(Read Holliday & Sons, 100 William St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Oil of Vitriol.

Enter in yarn at 130° F., bring to boil while turning, and turn to shade at that heat.

We show a full dyeing of Acid Magenta, which is a bright red and bloomy hue. (See recipe No. 6, for comments on the use of this dye in the production of a bright red.)

RECIPE No. 21.

Yellow on Worsted Yarn.

Chinoline Yellow on 100 pounds worsted yarn.

Prepare dye bath with

1 lb. Chinoline Yellow.
(Farbenfabriken of Elberfeld Co., 77 William St., New York.)
4 lbs. Oil of Vitriol.
10 lbs. Glauber's Salt.

Enter in yarn at 120° F.; bring to boil while turning, and turn to shade at that heat.

Chinoline Yellow is among the finest and purest of the acid yellows. This dye is of great excellence, and produces a fine, rich shade of greenish yellow. The powder is very soluble, and the shades produced by it are very fast. It is used largely by silk dyers and printers, on account of its fastness to light and soap and purity of shade. (See recipe 15, in the January Supplement, of Chinoline Yellow in combination with Alizarine Green C, for the production of a shade of green; also recipe 26, this issue.)

RECIPE No. 22.

Medium Blue on Worsted Yarn.

Wool Blue S S on 100 pounds worsted yarn

Prepare dye bath with

1¼ lbs. Wool Blue S S.
(John J. Keller & Co., 104 Murray St., New York.)
3 lbs. Oil of Vitriol.
10 lbs. Glauber's Salt.

Enter in yarn at 120° F., bring to boil while turning, and turn to shade at that heat.

Wool Blue SS for an acid blue is very soluble in hot water, produces level shades, does not rub or crock, and is fast and cheap. It will penetrate the thickest fibre, as it works on the goods very slowly.

RECIPE No. 23.

Brown on Cotton Knit Goods.

Thio-Catechine 3 on 100 pounds knit goods.

Prepare dye bath with

15 lbs. Thio-Catechine 3.
(Sykes & Street, 85 Water St., New York.)
10 lbs. Common Salt.
10 lbs. Carbonate of Soda.

Enter in cloth at 140° F. Bring temperature up to 200° while turning, and turn one hour at that heat. Wash off and enter second bath of

5 lbs. Bichromate of Potash.
5 lbs. Oil of Vitriol.

Turn one-half hour at 140° F. Wash.

We show a dark shade of brown, dyed with Thio-Catechine 3. The color is a full shade of cutch brown. This dye has a number of advantages which the dyer will appreciate upon using it. (See recipe 11 in the January Supplement for a similar use of this dye on knit goods.)

RECIPE No. 24.

Medium Blue on Worsted Yarn.

Acid Blue 100 on 100 pounds worsted yarn.

Prepare dye bath with

2 lbs. Acid Blue 100.
(The Hanna-Schoellkopf Co., 135 No. Water St. Philadelphia.)
4 lbs. Oil of Vitriol.
10 lbs. Glauber's Salt.

Enter in yarn at 120° F. Bring temperature up to boil while turning, and turn to shade at that heat.

Acid Blue 100 comes in the form of a dark blue powder, easily soluble in hot water. It will combine readily with all acid colors, and level dyeings are produced from it.

RECIPE No. 25.

Rose on Cotton Yarn.

Rhodamine 3 G on 100 pounds Cotton yarn.

Mordant in the usual way with

Tannic Acid,
Tartar Emetic,

and dye in a bath with

1½ lb. Rhodamine 3 G.
(C. Bischoff & Co., 87 Park Place, New York.)

Enter in yarn at 90° F., bring temperature up to 120° while turning, and turn to shade at that heat.

We show, here, a very fine shade of deep rose color, dyed with Rhodamine 3 G, which will produce on light dyeings fine pinks. Some very rich shades can be produced by varying the amount of dyestuff. (See recipe 14 in the January supplement for a pink.)

RECIPE NO. 26.

Green on Worsted Yarn.

Alizarine Green on 100 pounds worsted yarn.

Prepare dye bath with

2 lbs. Chinoline Yellow.
20 lbs. Alizarine Green C.
(Farbenfabriken of Elberfeld Co., 77 William St., New York.)
5 lbs. Oil of Vitriol.
10 lbs. Glauber's Salt.

Enter in yarn at 120° F., bring to boil while turning, and turn one, to one and a half hours at that heat.

The above combination produces a full dark and a fast shade of green. The two dyes work evenly and well together on the fibre, leaving it in a clean and soft condition, and free from crocking. (See recipe 21, this issue).

RECIPE NO. 27.

Black on Cotton Yarn.

Chromanil Black F on 100 pounds cotton yarn.

Prepare dye bath with

6 lbs. Chromanil Black F.
(New York & Boston Dyewood Co., 55 Beekman St., New York.)
20 lbs. Glauber's Salt.
2 lbs. Soda Crystals.

Enter in yarn at boil, and turn one hour at that heat.

Then turn one-half hour in a fresh bath, to which

1 lb. Bichromate of Potash
3 lbs. Blue Vitriol

have been added. Wash.

Chromanil Black F is an extremely fast black. It will stand washing, and will not bleed into white, and will stand exposure to light; and when the cotton is woven with wool, the wool can be cross dyed. Chromanil Black F is well adapted for hosiery, as it gives a black similar to the Aniline Salt Black. (See 1897, recipes 106, 138, 159, for colors from other brands of Chromanil).

RECIPE NO. 28.

Medium Blue on Cotton Yarn.

Diamineral Blue R. on 100 pounds cotton yarn.

Prepare dyebath with

1½ lbs. Diamineral Blue R.
(Wm. J. Matheson & Co., 178 Front St., New York.)
2 lbs. Sal Soda.
20 lbs. Glauber's Salt.

Enter in yarn at boil, and turn one hour at that heat.

Diamineral Blue R produces a fine, rich and bloomy shade of blue, and by dyeing direct, as per this recipe, an excellent shade is produced, which is cheaply and quickly obtained. In order to produce very fast shades of blue, the yarn can be topped off in a second bath with Sulphate of Copper and Bichromate of Potash. (See recipe 178 (1897) for a black on cotton yarn from Diamineral Black B.)

RECIPE NO. 29.

Light Blue on Cotton Yarn.

Oleine on 100 pounds cotton yarn.

Prepare dye bath with

3½ lbs. Oliene.
(Bosson & Lane, 38 Central Wharf, Boston.)
10 lbs. Glauber's Salt.
1 lb. Erie Blue.

Enter in yarn in dry state. Turn 1¾ hours at boil, then shut off steam, and turn one-half hour longer. Lift and wash.

By using Oleine in the dyebath, there will be saved the expense of boiling of the yarn before dyeing. It also helps the dyestuff, and makes the yarn soft and pliable.

RECIPE NO. 30.

Black on Cotton Yarn.

Alizarine Black on 100 pounds cotton yarn.

Prepare dye bath with

4 lbs. Alizarine Black.
(Victor Koechl & Co., 79 Murray St., New York.)

50 to 80 lbs. Common Salt.

Enter in yarn at 160° F. Bring to boil while turning, and turn till bath is exhausted. Rinse and enter a bath to which

2 lbs. Developer A R
2 lbs. Acetate of Soda

has been added. Turn one-half hour cold, and wash.

Alizarine Black produces a very fast and bloomy shade of black. The bath exhausts at each dyeing, giving the same shade of black for each batch. The black is well adapted for hosiery and piece dyeing.

RECIPE NO. 31.

Medium Blue on Worsted Yarn.

Erioglaucine on 100 pounds worsted yarn.

Prepare dye bath with

3 lbs. Erioglaucine.
(John J. Keller & Co., 104 Murray St., New York.)
3 lbs. Oil of Vitriol.
20 lbs. Glauber's Salt.

Enter in yarn at 140° F. Bring temperature up to boil, and turn to shade at that heat.

We show here a full dyeing of Erioglaucine, with 3 per cent. of the color, which gives a full and bloomy shade of navy blue. Erioglaucine is a very soluble powder, and the goods to be dyed can be entered in the dyebath at a high temperature and produce even shades. (See recipe 5 in the January Supplement.)

RECIPE NO. 32.

Dark Blue on Worsted Yarn.

Marine Blue and Acid Black on 100 pounds worsted yarn.

Prepare dye bath with

1 lb. Marine Blue.
(Stone & Ware Co., 157 Maiden Lane, New York.)
3 lbs. Acid Black.
10 lbs. Glauber's Salt.
4 lbs. Oil of Vitriol.

Enter in yarn at 120° F. Bring to boil while turning, and turn to shade at that heat.

The shade here given, in some cases, would answer for a blue black, but on looking at it overhand, it has that full, bright, bluish look, which is got by adding the Marine Blue to the Acid Black. Marine Blue in itself, produces a fine indigo shade of blue, but when combined with Acid Black, darker shades are produced, which are fast to all dyehouse tests, giving a fine, clean color, and cheap. Both dyes work well together. (See recipe 4, January issue, for same combination on wool and shoddy yarn.)

New Dyes.

We call attention to the following dyes that are used in our recipes for this month, comments upon which we refer to our dyer's notes.

Wool Blue SS, supplied by John J. Keller & Co., New York, used in producing a medium blue on worsted yarn.

Acid Blue 100, from Hanna-Schoellkopf Co., Philadelphia, for a medium blue on worsted yarn.

Oliene, from Bosson & Lane, Boston, for a light blue on cotton yarn.

Alizarine Black, from Victor Koechl & Co., New York, for a black on cotton yarn.

Roundabout Notes.

A French patent has been taken out for white and parti-color discharges in paranitraniline red and allied dyes. This is another contribution towards the solution of a problem which is engaging much attention at present. The patentees agree with Wolff's remarks about the Hoechst azo discharge, that it does not give a pure white except at the expense of a weakening of the fibre, and that the color lakes are not fast. The new process is founded upon the power which grape sugar possesses of reducing azo-dyes upon the fabrics in alkaline solutions, and in the presence of alcohol, phenols, naphthols, glycerine, acetine, and similar substances. The bleached cotton is prepared with beta-naphthol, dried, treated with diazotised paranitraniline, washed, soaped, again dried, and then impregnated with glucose. It is then again dried, printed with a strongly alkaline white discharge

which contains glycerine, glucose, and a phenol as well as the usual thickening. After printing, the stuff is dried, steamed, acidified, washed and soaped. In padding it is not necessary to treat the stuff before printing if enough grape-sugar is put into the printing color.

Artificial silk gives no acid fumes when burnt, and no smell of burnt horn, and has a greater specific gravity than natural silk, i. e., 1.49 against 1.36. Both artificial and natural silk swell a great deal before dissolving in Schweitzer's reagent; and the addition of water or hydrochloric acid to the solution precipitates artificial silk in white flakes. When dissolved in pure sulphuric acid artificial silk forms a syrupy dark yellow solution which is turned blue by solution of sulphate of diphenylamine. This reaction depends on the formation of nitric acid by a partial reduction of the trinitrocellulose, and affords an excellent means of detecting the presence of the smallest admixture of artificial with natural silk. The presence of artificial silk can however be recognized without solution by dipping a piece of the material into solution of sulphate of diphenylamine, whereupon any threads of artificial silk which may be present are turned blue, while natural silk remains unchanged. There is, however, a much simpler method for the identification of a fabric made entirely or principally of artificial silk. This is just to unravel a little of the stuff and chew it well. This treatment reduces artificial silk to a pulp showing no signs of threads, but has no effect upon natural silk.

—One very common method of waterproofing is just simply to fill the pores of the material by precipitating alumina in them. With wear, the alumina gets rubbed out and the waterproofness is lost. If the fabric is impregnated with ammoniacal oxide of copper, a gelatinization of the outer surface of the fabric is produced, and the stuff is made waterproof, but its strength and durability are much impaired. Breitenfeld adds materials which hinder this action on the part of the copper-compound, such as tannin, albumen, or ferrocyanides. He thereby gets tannates, albumenates, or ferrocyanides of copper precipitated in the pores of the fabric. Fabrics prepared according to this process, and buried in wet earth, retain both their color and their imperviousness to dihydric monoxide. They are imperishable and odorless.

—Stuffs prepared by the Breitenfeld process can be subsequently treated with paraffine, soap, or the like, in the usual way. We subjoin some examples illustrative of the application of the process:

1. The fabric was slowly drawn through a 20 per cent. tannin solution, the excess of which was removed by passing the stuff under light pressure between wooden rollers. The piece was then drawn through an ammoniacal solution of copper at such a rate that every part of it remained therein for two to three minutes and then quickly dried. The strength of the copper solution is such that it contains 12-15 per cent. ammonia, and about 1.6 per cent. of copper.

2. The same tannin solution was used, but the piece on leaving the copper solution was strongly pressed between iron rollers and then sent back through the tannin, and finally quickly dried at 70 degrees, C.

3. The material was drawn through a 4 per cent. solution of white of egg, then gently pressed between rollers, and then drawn through the copper solution and quickly dried.

4. The stuff was drawn first through the copper solution, strongly pressed, and then drawn through the white of egg solution, and sharply dried.

5. The fabric was soaked with a four per cent. solution of potassium ferrocyanide, lightly pressed, then passed through the cupreous solution, then through water to remove the soluble potassium salts, and then sharply dried. Two per cent. acetic acid may be used instead of water, to remove any excess of copper.

6. The material is treated as in the last example, but reversing the order,

and using the copper solution first, and then the ferrocyanide.

Soxhlet has patented a method of saving indigo in the vat-dyeing of wool. He prepares the wool first with alkaline permanganate, and then with bisulphite of chromium or aluminium, before dyeing. The wool after being thus mordanted with chrome or alumina becomes a darker blue than can be got with any given quantity of indigo used without those oxides, and the blue is faster to washing.

Koechlin has patented a process for making paranitraniline red and its relations on vegetable fabrics and on silk faster to light. The process consists in passing the dyed stuff through boiling water containing half per cent. of nitric acid, and then washing. The water may contain another half per cent. of chromate with advantage, as that salt makes the color faster. Any browning of the red may be obviated by adding minute quantities of copper salt to the nitric acid bath. The process will act in the cold, but then the water must contain 10-20 per cent. of acid, and the stuff must stay in it an hour. The fastness to light is further enhanced by a boiling bath of acetate of lime or magnesia after treatment with nitric acid and washing.

Silk Gloss on Cotton Yarn.

BY A. VON LEHMANN.

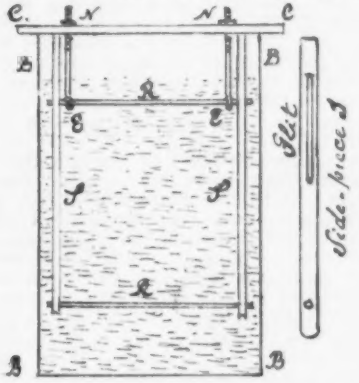
In 1844, John Mercer discovered by an accident, that the cotton fibre when treated with strong soda-lye, shrinks considerably in length and becomes semi-transparent. Further investigation developed that the shrinkage amounts from one-fourth to one-fifth of the original length of the fibres; its shape becomes more or less rounded; its twist almost disappears, while its walls become thicker; its tensile strength is nearly doubled. The fibre-substance, cellulose, ($C_{12}H_{20}O_{10}$), is transformed into so-called alkali-cellulose, $C_{12}H_{20}O_{10}2NaON$), and after washing out the soda-lye with water, a body, ($C_{12}H_{20}O_{10}H_2O$), is obtained; one molecule of water being chemically combined which weighs 4.5 to 5.5 per cent. heavier than the raw cotton. Alkalized, or "mercerized," cotton presents the characteristic feature, that it absorbs much more dyestuff from the bath, i. e., shows colors of much greater intensity than cotton not prepared with soda-lye. Mercer's exhibit of dyed alkalized cotton, therefore, at the London Exposition in 1851, created a sensation; but the advantage gained in dyeing by the production of finer colors with less dyestuff, seemed not to compensate for the loss in manufacturing sustained by the shrinkage, and the process of "mercerization" came to be but very sparingly employed in special cases.

Thus the Crefeld dyers, Thomas & Prevost, concluded to mercerize the cotton in some half-silk goods, for the purpose of producing with dilute solutions of dyestuffs, colors of greater intensity upon the cotton than upon the silk, and conceived the idea to prevent the shrinking of the cotton by subjecting the material in a strongly stretched condition to the action of a concentrated solution of caustic soda in the cold. They not only achieved their aim with perfect success, but found, to their astonishment, that the cotton had assumed a gloss equal to that of the silk. They developed this discovery into a process to produce silk gloss upon cotton by mercerization, which is protected by letters-patent in Germany. The beauty of the process is, that it is carried out in the cold and can, therefore, be applied to cotton-mixed goods, and that the silk gloss produced by it is permanent and stands washing, dyeing and printing; it even produces a half-bleach.

The discovery of Thomas & Prevost caused a general stir, and led at once to numerous experiments to practically utilize the principle, but notwithstanding its seeming simplicity, few only were successful. In order to understand the cause of so many disappointments, let us contemplate the entire process, which consists of four distinct operations, viz:

1. Boiling off.
2. Stretching.
3. Mercerizing.
4. Washing.

1. The cotton yarn is boiled off with soda as usual, and rinsed in cold water. The object of this operation is not only to clean the cotton from greasy and other contaminations, but more especially to expel from the material the air contained in it, which is of particular importance to ensure the uniform penetration of the yarn by the mercerizing liquid. The rinsed yarn, is therefore, but lightly wrung, or beter, drained, before placing it on the stretching apparatus, and in case the yarn has become somewhat dry, it must be passed in boiling water to again drive out the air. It must in every case be put upon the stretcher in a thoroughly wet condition because by the stretching, itself, some water is still forced out. This condition is apparently not generally regarded as



essential as it really is, and to its neglect are probably attributable the unfavorable results of many experiments, the cotton presenting a streaky or patchy appearance, glossy in some parts and dull in others.

II. The second operation consists in strongly stretching the thoroughly wetted yarn, which stretched condition must be maintained undiminished throughout all the following stages of the process. Various contrivances have been devised for this purpose, some of them quite ingenious, and yet deficient, inasmuch that they fail to maintain the first-produced stretch of the yarn, giving way to the enormous tension which is produced within the fibre by the contracting action of the concentrated alkaline bath applied in the third operation, and should be resisted without the slightest alteration, by the stretching apparatus, until it is finally overcome in the last stage of the process.

The accompanying sketch represents an apparatus devised (and patent applied for) by the writer, which has proved as efficient as it is simple in construction, easy to handle and inexpensive. It consists of a rectangular wooden box, "B B B B," which contains the mercerizing bath and the stretching apparatus proper. The latter is composed of a wooden headpiece, "C C," about 1½ inches thick and 3 inches broad, whose ends projecting over the sides of the box are shaped into handles, by which to grasp it in working the stretcher. To the under side of the top piece are attached the wooden side pieces, "S S," one inch thick and three inches broad, each having near its lower end a hole, about one inch in diameter; and about two feet above it a slit of the same width, reaching upward to near the top piece. Close to the side pieces two eye-screws, "E E," with eyes of one inch diameter opposite the lower ends of the slits in the side pieces are with their shafts loosely inserted in holes in the top piece, "C C," and held in position by the nuts, "N N," above.

Finally, two iron rods, "R R," ¾ inch in diameter, are loosely inserted in the holes of the side pieces, the upper one passing at the same time through the eyes of the screws.

Rods of less strength, which were used in the first experiments, proved inadequate to the powerful strain brought to bear upon them by the shrinking of the yarn; they were bent and consequently the loops of yarn became uneven in length, and only those near the eye-screws presented something approaching an acceptable gloss, which showed that the yarn must be stretched as much as its strength will allow, and must then be held firmly in that condition throughout the entire process.

In order to change the stretcher, the rods, "R R," are withdrawn from their places, passed through the ends of the hank of yarn, and put back into their

respective places. Then the yarn is evenly distributed upon them, the thinner, the better, to lessen its strain upon the rods, and finally the nuts, "N N," are drawn tightly. The yarn thus stretched and immovably fixed in that condition, is now ready for the mercerization.

III. The process of mercerization is generally well known. For the production of a silky gloss upon cotton, however, a certain concentration of the mercerizing bath is required. Thomas & Prevost's patent calls for a solution of caustic alkali of 15°-32° Be. John Mercer operated with solutions of 20°-30° Be., and a solution of 30° Be. has been found to be best adapted to all cases. Now, the dyer being familiar with his scales and weights, and his liquid measures, is not apt to fail in producing by their aid a solution of any desired concentration, and will surely prefer their quick use to the tedious work with the hydrometer.

It may be remarked, therefore, that 79 grains of caustic soda dissolved in one litre water give a solution of 10° Beaume (or 7.9 grains soda to one litre water for 1° Be.), so that a solution of 30° Be. is obtained with 237 grains caustic soda per litre water, or 2 lb. 6 oz. per American gallon. The solution being prepared accordingly, with cold water, the box, "B B B B," is filled with it, and the stretcher carrying the wetted yarn is immersed in it. The penetration is instantaneous, but to promote its evenness the stretcher is repeatedly moved up and down. After the lapse of 5 minutes the first stage of the process is reached, that is, the cotton has assumed a semi-transparent parchment-like appearance. A longer immersion is useless, but does not injure the cotton. Warming the bath is of no advantage but heating it is directly injurious to the production of the gloss, and in the case of mixed fabrics destroys the animal fibre.

At this stage of the reaction, the stretcher is lifted from the mercerizing bath, and the cotton, still upon the stretcher, is thoroughly washed with cold water to remove the soda-lye, until the interior tension has ceased. This operation requires particular mention; if even a small quantity of soda-lye is left in the cotton, it is apt to continue its action and render futile all the work bestowed upon the material. But a little practice will soon enable the operator to determine the end of the reaction, and to satisfy himself that the caustic soda has been washed out he may test the cotton with litmus paper. For perfect safety, however, the washed yarn is passed in a bath of water acidulated with acetic acid, in order to neutralize the last trace of alkali which may be left in the cotton. It is then washed again in water alone, finally taken off from the stretcher and dried.

Cotton yarn thus treated shows a perfect silk gloss, and if the yarn is given a twist similar to that of chappe silk, it is scarcely distinguishable from the latter material.

For industrial work the box containing the soda-lye is made long enough to admit several stretches at one time, and the up and down motion may be imparted to them by a system of levers or by a hoisting contrivance in connection with a bath on either side of the box, to raise and lower the stretchers by catching them under their projecting ends or handles. It is also advisable to keep a supply of soda-lye on hand, from which to replenish the mercerizing bath in the measure, as in the course of continued operation the liquid is absorbed by the yarn. The hydrometer may be employed to determine the concentration of the bath at the beginning, and to control it in the course of protracted work, although the bath may be kept standing, if well covered, for a considerable time without material alteration.

It remains to remark that, if a hank of ordinary cotton yarn, raw or bleached, a hank of yarn mercerized in the stretched condition, and a hank mercerized without stretching, are immersed in a solution of direct-dyeing dyestuff, the second is, in intensity of color, superior to the first, but the third by far superior to both.

The above described apparatus may also be used for applying the process to mixed fabrics, notably to half-silks, with cotton warp, since the animal fibre is not attacked when treated with caustic soda in the cold. But tissues with cotton weft, requiring a stretching across their width, are stretched upon a tenter-frame, or similar apparatus, drenched with soda-lye until the first stage of the reaction is reached, and then treated as stated for cotton yarn.

QUESTIONS AND ANSWERS.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

Dogwood Heads.

Editor Textile World:

Can you put us in communication with parties that use dogwood bobbin heads in the rough?

South Carolina. S. S. & B. C.

We have replied by mail.

Southern Mill Stock.

Editor Textile World:

Will you please give me the address of a few brokers in Boston, New York or Philadelphia handling Southern mill stocks?

Beard.

We shall be pleased to furnish the address of our correspondent to any parties interested in the above. We know of no brokers making a specialty of Southern mill stocks.

Stop Motion for Circular Knitting Machines.

Editor Textile World:

Kindly inform me from whom I can procure a stop motion for Nye & Tredick machines. G. A.

You can procure from Nye & Tredick, 606 Arch St., Philadelphia, a good mechanical stop motion for their make of machines, and also for other makes of machines.

About Silk.

Editor Textile World:

Will you please inform me if it is injurious to keep silk in a cold place, and what effect it has upon its lustre. I am more or less troubled in cold weather with the silk being dull and sticky. We are making elastic web for garters and suspenders and some non-elastic goods. Let me say that I am very well pleased with the Textile World, as it is the most useful textile journal I ever came across.

Rhode Island. T. B.

We do not think that silk kept in a cold place is injured by the temperature, but cold places are apt to be damp, in which case the silk is subjected to injury. A dry, cold place is often used for the storage of raw silk. As a rule, however, we should say that it would be safer to keep silk in a warm, dry place, in order that it may retain its lustre and other qualities. Cold weather is apt to make silk brittle, and it is sometimes more difficult to wind in a skein, in cold weather, on this account.

Cotton Publications.

Editor Textile World:

Will you be kind enough to give me the names of a United States general directory of manufacturers, a special cotton directory, and the names of the best cotton journals published in the United States?

Barcelona, Spain. Rosendo Giralt.

The best general directory of manufacturers that we know of is one published by the Manufacturers' Publishing Co., 150 Fifth Ave., New York City. The nearest thing to a cotton directory, which gives the names of all the buyers, dealers and merchants operating in cotton, in this country, is the one published by the Textile World. There is no journal published in this country devoted to cotton exclusively. The nearest approach to it is the Financial Chronicle, and the Journal of Commerce and Commercial Bulletin, both published in New York City.

Dogwood, Etc., for Shuttles.

Editor Textile World:

I am referred to you by the publishers of the Scientific American, New York. I am anxious to find out if it is a fact that there is no factory for the manufacture of shuttles out of dog-wood and persimmon in this country, and that all of these woods are shipped to England, manufactured there, and returned. Is there made in this country any machinery for manufacturing these blocks into shuttles? If so, where? What do these blocks net per one thousand? In what shape and size can dog-wood be best sawed for best returns?

Virginia. W. W. M.

These questions are similar to others received from Southern sources. G. N. Goodspeed, Winchendon, Mass., makes machinery for shuttles. There are 16 shuttle manufactories in this country, besides a few small ones in Paterson, N. J., which make silk loom shuttles. Some of the largest ones are represented in our advertising pages. They all, probably, use both dogwood and persimmon. These woods are shipped occasionally abroad. In regard to the export of such blocks to England and elsewhere, we would suggest writing to J. Elwood Cox, High Point, N. C., who, we think, furnishes the majority of the shuttle makers in this country with their blocks, and does the only export business. We do not think that there are any foreign shuttles imported, but that all of our mills use the American make.

The net price of these blocks per thous-

and is from $20 to $140, according to the size. The size and price may be put as follows: 16x2x1¾, 4 cents each; 16x2x2, 4½ cents each; 14½x1½x1¾, 3 cents each; 18x2x2¼, 6 cents each; 19x2x2¼, 7 cents each; 21x2¼x2½, 10 cents each; 23x2¼x2½, 14 cents each. These prices are delivered at the factory. We think the average size for these blocks is 16x2x2. However, each shuttle maker orders according to his particular requirements. The blocks should generally be about one inch longer and about ¼ inch larger in width and depth than the shuttle which it is expected to make. When ordering blocks, shuttle makers generally order an assortment of sizes, according as they estimate their trade will require.

Hours of Labor — Constitutional Amendment.

Editor Textile World:

Can you readily give me the text of the resolution introduced into the House of Representatives by Hon. W. C. Lovering, for the equalization of the hours of labor throughout the United States, by an amendment to the Constitution?

Massachusetts. S. J. A.

The resolution that was introduced by Mr. Lovering was as follows:

"Whereas, this variation in the length of the legal working week creates conditions of discrimination as between the citizens of the several states of the union which operate to the disadvantage of both labor and capital in many localities, resulting in unequal earnings for a given amount of capital, and unequal wages for a given amount of labor, which unequal conditions are contrary to the fundamental theory of the constitution of the United States which contemplates equal rights and uniform principles to all citizens of the United States, irrespective of the particular state in which they may happen to dwell; and,

"Whereas, this lack of uniformity in the hours of labor is the outcome of state legislation, and is beyond the power of the states, acting through their legislatures, to make uniform, by reason of the decision of the supreme courts of several states, to the effect that all laws regulating hours of labor are unconstitutional in those states, and,

"Whereas, the unequal and partial restrictions disturb the equilibrium of industry, and are serious obstacles to national progress; therefore be it

"Resolved, That the congress of the United States do recommend to the several states of the union the adoption of the following amendment to the constitution of the United States, to wit:

"Article 16, the congress shall have power to establish uniform hours of labor in manufactories throughout the United States."

Sizes of Knitted Fabrics.

Editor Textile World:

I would like the sizes of ladies' vests and drawers; and the length of boys', ladies' and misses' stockings, from centre of heel to top of leg. All ribbed goods.

New York. S. P.

We give below the sizes of the ladies' garments:

RIBBED VESTS.

Bust =	30 in.	33 in.	36 in.	39 in.	42 in.
Size =	2	3	4	5	6

Length of Sleeve from Centre of Back.

25	25½	26	26½	27

Length from Back of Neck to End of Skirt.

28	29½	31	32½	34

RIBBED DRAWERS.

Full Length with Binding.

37	39	41	43	45

Length of Inside Seam.

25	27	29	31	33

Length of Waist-band.

26	28	30	32	34

We give below the sizes of children's stockings, both plain and ribbed.

PLAIN HOSE.		RIBBED HOSE.	
Length of Foot.	*Length of Leg.*	*Length of Foot.*	*Length of Leg.*
4½	12	5½	16
5	13½	6	18½
5½	15	6½	21
6	16½	7	22½
6½	18	7½	24
7	20	8	25½
7½	22	8½	27
8	24	9	28½
8½	26	9½	30
		10	30
		10½	30

Worsted Mittens.

Editor Textile World:

Will you kindly give us the names of several manufacturers who make fashioned knitted worsted mittens?

New York. A. S. M.

There are quite a number of manufacturers in this country who make these articles. Among them may be mentioned several manufacturers located at Highlandville, Mass. By an examination of the Textile World's Directory for 1897 the names of these manufacturers can be readily obtained, wherever located.

Cut Pieces.

Editor Textile World:

I wish you would give me the address of a manufacturer, jobber or wholesale dealer in ladies' dress goods, such as cassimeres, plaids, worsted serges, etc. I want a place where I can buy the goods without taking entire pieces, as I sell only from samples, using swatches and taking orders from them.

F. I. D.

Will refer you to the dry goods section

of the Textile World Directory, which contains just the information you want. There are several houses in New York who make a specialty of this business, and we have answered by mail.

New Publications.

Knitting Machinery, Catalogue and Price List, for 1898. Scott & Williams, builders of knitting machinery, 2079 E. Cumberland St., Philadelphia, have issued a very handy catalogue and price list of their productions. Aside from those in the catalogue, of a special line of manufacture, it contains much general information that knitters like to know, including a number of useful tables. Among the latter are those showing the gauge of needle used in ribbed underwear, in automatic seamless hosiery machines, etc.; table showing greatest number of cuts that can be safely made in dials of ribbed knitting machines, latch needles, etc. Scott & Williams have been established since 1865, and among their specialties in knitting machinery may be mentioned machines for hosiery and underwear; bicycle and golf hose; finishing and ornamenting machinery; needles, parts and supplies.

Mineral Resources of the United States, for 1896. This is one of the volumes of the 8th annual report of the United States Geological Survey, covering 1896-97, published at Washington, D. C., David T. Day, chief of division. This is a volume of 640 pages, and covers such subjects as iron ores of the United States, iron and steel, and allied industries in all countries, gold, silver, gold bearing pudding stones, copper, lead, zinc, aluminum, quicksilver, manganese, nickel, antimony, coal, etc.

Soluble Oil. A small pamphlet has been issued under this title, by Bosson & Lane, 36 Central Wharf, Boston, which is well worth perusing by manufacturers. Soluble Oil is also known as Turkey-red oil and alizarine assistant, being a compound of sulphuric acid, with ricinoleic acid neutralized with alkalies. The standard qualities are made from castor oil. The value of oil in the dyehouse as an assistant in coloring cotton is a recognized fact, and has been for a great many years. This oil acts as a mordant and a softener at the same time.

Cassier's Magazine, for January, 1898. Published by the Cassier Magazine Co., World Building, New York. This magazine begins the new year with a remarkably fine number, containing articles on the following subjects: The Largest Steamship Afloat—a complete description of the record breaker "Kaiser Wilhelm der Grosse;" American Cableways in Open-pit Mining—a chapter in rope-way engineering; The Blight of Trade Unionism—a review of British labor conditions; Dustless Buildings—the use of filtered air for heating and ventilating; Carriage and Wagon Building on the Midland Railway, England—a representative British railway industry; Electric Power in the Machine Shop—its present status in the United States; A Record in Chimney Reconstruction—rebuilding a 162-foot stack in thirteen days.

Appleton's Popular Science Monthly, for January, 1898. Published by D. Appleton & Co., 72 Fifth Ave., New York. $5.00 per annum. An important article by G. M. Sternberg, Surgeon General of the United States Army, on the Causes and Distribution of Infectious Disease, occupies the first place in this issue. Professor Ripley takes up the Aryan Question, and gives us a general view of its present status. Science and Morals, by an eminent French chemist, discusses the relations between science, morals and religion. Feet and Hands is the first installment of a popular study in comparative anatomy, and gives a very good example of one of the processes of evolution, which in this case has resulted in a wide differentiation of two originally similar structures. The methods which make Double Taxation possible are discussed by the Hon. David A. Wells. Other articles are Aborigines of the West Indies; The Foreign Element in our Civilization, etc.

Cotton Cloth Designing, by James Holmes. Burnley, 38 Manchester Road, England: Lupton Bros. Price $2.50. This is a work just published, by a well known author and lecturer on weaving. It is written by a practical man, and is an endeavor to show the range of patterns which may be woven by the aid of the dobby machine. No atetmpt is made to deal with jacquard designing. It is fully illustrated by 41 colored plates, showing nearly three hundred patterns; and to further enhance its value, sample cloths of the typical examples are pasted in the book. These are fully worked out showing the design, the looming, pegging plan, and heald knitter's instructions. It will be found useful alike to the buyer, the seller, or the maker of cloths, as well as to managers and overseers. Twills, double cloth, corduroy, doups, gauze, honey-comb, lappet, pile, satins, etc., are treated of in the contents.

Cotton Spinning, by William S. Taggart. Volume II. New York. Macmillan & Co. Pages, 233. Price, $1.75. This is the second volume of a work on cotton spinning, by one whose writings are familiar to our readers. Mr. Taggart has contributed for the last twelve months a number of valuable articles that have appeared in our Cotton Department. This volume includes the processes up to the end of the fly frames, and takes in such subjects as Drawing, Combing, and Fly Frames. There are 204 illustrations, including all the machinery and manipulations between the card and self-actor, or ring frame. Attention has not only been confined to the principles underlying the actual processes themselves, but an effort has been made to give the mechanical details an interpretation which some of them have hitherto not possessed. The third volume will deal with the spinning processes.

House-heating Hints. This is the title of a pamphlet issued by Robert A Keasbey, dealer in non-heat conducting magnesia sectional coverings for steam pipes, boilers, and all other heated surfaces, 54 Warren St., New York City. In these days of economy, we think that house-keepers, and others using steam for heating, would be particularly interested in the perusal of this pamphlet, and we would suggest their writing for it.

Wool Jet Black BB and BBB. The New York & Boston Dyewood Co., 55 Beekman St., New York, have just issued their sample card of wool specimens colored with their Wool Jet Black BB and BBB. We would suggest manufacturers writing for the card.

Phosphates and Marls of Georgia, by S. W. McCallie, Atlanta, Ga. This is one of the series of the State publications of Georgia, under the auspices of the Geological Survey of Georgia. The author of this work is the associate geolo-

gist. It is more of a preliminary report on the phosphates and marls of that State. This work is of interest not only to the farmer, but to the manufacturer of fertilizers, and in this connection has some important bearing upon the cultivation of cotton, the land for which requires more or less fertilization.

Mechanical Draft. Published by B. F. Sturtevant Co., Boston, Mass., well known as the manufacturers of the Sturtevant blowers, exhaust fans, steam heating apparatus, steam engines, portable forges, etc., Jamaica Plain Station, Boston. This is a valuable work, though issued with special reference to the manufactures of this company. It is attractively gotten up, in book form, of 385 pages, on heavy, calendered paper, profusely illustrated, and is a practical treatise on the subject of mechanical draft. The work takes up this subject and discusses it at great length, and treats it as its importance demands. Every endeavor has been made to render the work authoritative. For the discussion of the subject in all of its aspects, it is divided into thirteen chapters, each chapter having a number of subdivisions, under the general heads of water, steam, combustion, fuels, efficiency of fuels, efficiency of steam boilers, rate of combustion, draft, chimney draft, mechanical draft, advantages of mechanical draft, the Sturtevant fans for mechanical draft and the application of these fans for this purpose.

W. J. Matheson & Co., 182 Front St., New York, have issued a number of bulletins and color cards relating to their products. Among them may be mentioned those relating to Diamine Jet Black, Lanafuchsine S B and S G., and different brands of anthracine colors. The most elaborately gotten up affair, showing the colors represented by this house, is a case of dyeings on loose cotton, fast to milling, produced with diamine colors, by the coupling process.

Tops, A New American Industry. Published by the Arlington Mills, Lawrence, Mass. 137 pages. This work is finely gotten up, on a high quality of paper, on which the artistic effect of the printing and illustrations show to most excellent advantage. It has been written largely as a study in the development of the American worsted manufacture. The literary style is felicitous. The scope of the work may be appreciated by the following titles of the chapters: The Genesis of the American Worsted Manufacture; The Specialization of the Worsted Industry; Description of a Top Mill; The Solvent Processes for Cleansing Wool; The Hygroscopic Property of Wool; How Tops Are Sold; The Mechanical Advance in Worsted Manufacture. The publication of this work is due to the enterprise of the Arlington Mills, which has a history since 1865, when it was incorporated under the name of the Arlington Woolen Mills, which name was changed to the Arlington Mills, in 1875. The capital stock has been increased from $500,000, in 1877, to $2,500,000, in 1896. The Arlington Mills and their products have a national reputation. An idea of the size of the mills may be obtained from the statement that the aggregate area of their floor space is 1,032,516 square feet, for the worsted department, and 261,195 square feet for the cotton department. The total floor space is 29.7 acres. The total horse power required to operate the mills is 8,000.

Quarterly Journal of Economics, for January, 1898. Published for Harvard University, by George H. Ellis, 141 Franklin St., Boston. This welcome journal comes out for January with several highly interesting articles, as may be judged of by their titles, as follows: Cournot and Mathematical Economics; Canada and the Silver Question; Monetary Changes in Japan; The Coal Miners' Strike of 1897; The Lease of the Philadelphia Gas-Works.

Pocket Manual of the Stocks which Paid Dividends for the year 1897, in Boston and New York. Leland Towle & Co., 7 Congress St., Boston, have issued their annual pocket manual, wherein are listed alphabetically and by calendar months the stocks which paid dividends during the year 1897. The manual is a great convenience for ready reference on the part of investors. Not only are railroad and mining stocks listed, but manufacturing companies, including the New England textile mills. The manual will be sent free to applicants, on enclosing a two-cent stamp to cover postage.

Industrial News.

—Joseph C. Tully, who has been connected with John H. Lyon & Co., dealers in paper and woolen manufacturing materials, 10 and 12 Reade St. and 35 Park St., New York, and Worcester, Mass., for the past 15 years, was admitted to the firm from January 1st, 1898.

—Holland & Webb, 487 Broadway, New York, importers and commission merchants in yarns of all numbers and qualities, are doing a very satisfactory trade, and their methods of dealing are highly appreciated by their customers. They have branches in Nottingham, Leicester and Manchester, England; Calais, Caudry and Chemnitz, on the Continent.

—Eichmann & Sternberg have removed from 488-492 Broadway, to 530 Broadway, corner Spring Street, New York City. They are ready to supply any orders for plain and gassed cotton yarns, hosiery cotton yarns, and also mercerized cotton yarns.

—Charles M. Musgrove of Plainville, Conn., has just equipped all the knitting machines in the Empire Mills at Cohoes, New York, with his improved quarter saver; also Tiffany Bros. Mill at Bennington, Vermont. The Halcyon Mill, Cohoes, New York, has a lot of his quarter savers in use, and last month he received an order for over 200 from the Plainville Manufacturing Co., Plainville, Conn. This quarter saver has great merits which are rapidly becoming appreciated by the trade. It is claimed to absolutely prevent quarters and holes in the cloth caused by the yarn breaking or running off the bobbin. It works perfectly on machines running 70 turns per minute. Mr. Musgrove offers to put a trial set on anywhere, without charge.

—The patent automatic cloth brushing attachment for knitting machines recently introduced by Charles M. Musgrove, formerly of Pittsfield, Mass., and now of Plainville, Conn., is meeting with good success, wherever it has been introduced; among recent orders was one Charles Cooper, of Bennington, Vermont, who has purchased a quantity for the use of his mill; orders also were recently filled for three Canadian mills.

—The Sumter (S. C.) Mill has had a prosperous year, having earned 12½ per cent. net, notwithstanding the heavy interest account.

—John W. Turner, 24 Swaine St., Bradford, England, one of the best known wool buyers of English wools, writes us that he is at liberty to execute orders for

any firm in this country, who may wish to entrust him orders.

—Elliot & Hall, manufacturers of the Elliot cloth folder and standard measurer, 54 Hermon St., Worcester, Mass., are quite busy just now with a full complement of help. Their level or drop centre table is giving the best of satisfaction, for its simplicity and efficiency.

—The Joseph Dixon Crucible Co., Jersey City, N. J., have shared in the general prosperity of business for 1897, to a most gratifying extent. The future with them looks particularly bright. To them, it appears that the trade has money, and is willing to spend it to them for a good article.

—The Berlin Iron Bridge Co., East Berlin, Ct., are furnishing a new roof structure, supported on eleven trusses, for the armory at Newburgh, N. Y. The new roof when completed will be much lighter, and will give the interior of the building a more roomy and substantial appearance than is now the case with the building, which is at present covered with a wooden roof. The company have also a contract for the substructure and superstructure of a new draw bridge over the South Shrewsbury River, in Monmouth County, N. J. This bridge is to be 180 feet in length and 40 feet wide. A contract has been given to the Berlin Company for furnishing and erecting the iron work of the new boiler house of the Riverside Worsted Mill, Providence, R. I.

—The Wm. S. Haines Co., 136 So. 4th St., Philadelphia, Pa., report that in January 1896, there were 25,000 Heintz Steam Traps in use; in January 1897, about 50,000 and in January 1898, 125,000. This increase last year of 75,000 probably breaks the record in the trap business, and indicates the ever growing interest taken by manufacturers in steam saving devices.

—Theodore C. Search has been elected president of the Pennsylvania Museum and School of Industrial Art, Philadelphia, for 1898. The enlargement of this school has been marked by an increased enrollment. The registration for the year 1897 shows 809 students, being an increase of 177 over the preceding year. Philadelphia is accredited with 650, and the other students represent eighteen States with one from Japan. The school has provision for 155 free scholarships and 121 actual holders of the same. The officers of the school are as follows: Dalton Dorr, secretary; Leslie W. Miller, principal of the school; Dalton Dorr, director of museum; chairman of executive committee, Theodore C. Search; art, Charles E. Dana; museum, William Platt Pepper; instruction, Theodore C. Search; and finance, C. N. Weygandt.

Lowell Textile School.

At a meeting recently held in Boston of the National Association of Wool Manufacturers, some interesting statistics regarding the Lowell Textile School were furnished. Although the first year of the school's existence was not completed until the 30th of last month, it was stated that the total number of applicants for the current term were 299, of whom 254 were enrolled as students, and were then in attendance. Of these, 70 were day students, coming from all parts of the United States and Canada. The bulk of the evening students were from Lowell, Lawrence and Nashua, with a few from Boston. The number of departments in the school is seven, including the wool and worsted department; the cotton yarn preparation department, and the wool and cotton weaving department; the chemistry and dyeing department; art department; a design department; and the department of mechanics.

Already applications are being received for admission next Ocaober, and the success of the first textile school in New England is already assured.

There has recently been added to this school, a lot of worsted machinery, contributed by Stoddard, Haserick, Richards & Co., of Boston, being the product of the works of Prince, Smith & Co., Keighley, England. This machinery will be erected in conection with the woolen plant already in place. A burr picker, from the Atlas Mfg. Co., Newark, N. J., has been added to the school's machinery. The attendance of the school is kept up remarkably well, there being 240 students in regular attendance. The popular lectures are being well attended. The chemistry and Dyeing Department is in a flourishing condition. Great credit is due, for the prosperity of the school, to Director Brooks and Prof. Umpleby.

Boiler Insurance.

The Mutual Boiler Insurance Co., Boston, of which Edward Atkinson is president and David W. Lane, secretary and treasurer, has issued a circular relating to the company and its work. The circular states that if the company is sustained in sufficient measure in its undertaking, its efforts will be devoted to an adequate inspection of boilers; to promoting safety, economy, and efficiency in steam engineering; and to indemnity for unavoidable losses. Of course, the prime object of the assured in such a company is to secure a regular and complete inspection of boilers in use, from time to time, at the lowest cost which is consistent with good work.

Textile Club Elects Officers.

The Textile Club held its annual meeting in Boston, in January, and elected officers for 1898, as follows: Stephen N. Bourne, Stark Mills, Manchester, N. H., president; Charles H. Richardson, Appleton Company, Lowell, and H. C. Atwood, Williamsville Manufacturing Company, Killingly, Conn., vice-president; George F. Whitten, Amory Manufacturing Company, Manchester, N. H., William B. Fittz, West Boylston Manufacturing Company, Oakdale, A. Tenny White, Globe Mill, Woonsocket, R. I., executive committee; George F. Whitten, Woonsocket, R. I., secretary-treasurer.

The Northrop Loom.

The Draper Co., Hopedale, Mass. have recently issued a new catalogue relating to their Northrop loom. The first announcement of this loom was made in the spring of 1895, but there were only a few practical demonstrations then in support of the assertions made concerning what the loom could accomplish, though excellent results had been obtained in the exhibition room of the company, where 80 looms were in operation. Since then, the loom has demonstrated for itself in practical operation, under ordinary mill conditions, that all of the statements that were made for it by the builders, three years ago, have been fully substantiated, and its value recognized by a large number of repeat orders that have been given for it from such mills as the Grosvenor Dale Co., Gaffney Mfg. Co., Spartan Mfg. Co., Amoskeag Mfg. Co., and others. This

loom represents vital principals in weaving and the use of mechanical ideas, which were never before successful. All cotton manufacturers must know by this time that the two main devices of this loom consist, first, in the filling changer that automatically replenishes the filling supply in the shuttle, and, secondly, a warp stop motion to protect the cloth from damage, thereby relieving the operative of the attention formerly necessary. The scope of the present devices attached to the loom may be understood when it is stated that there are a number of looms weaving goods, with yarns from 12's to 75's, including print cloth, all grades of sheeting, ginghams, lawns, and many special fabrics. The warp stop-motion can be applied to looms having more than one color of filling. The Gaffney Mfg. Co., of South Carolina, has 1400 of these looms, running on print cloth, and according to its statement, a saving is made of nearly 3-4c. per pound of cloth, in the way of labor. We would sugest sending to the Draper Co., Hopedale, Mass., for their latest catalogue of 43 pages, concerning this loom.

Burr K. Field.

It is with feelings of the deepest grief that we announce the death of Burr Kellogg Field, vice-president of the Berlin Iron Bridge Company, East Berlin, Ct., which occurred at his home in Berlin, Ct., on January 13th, after an illness of less than a week. Mr. Field was born inMay, 1856. He entered the Sheffield Scientific School of Yale University, in 1874, and graduated in 1877 as a civil engineer. Immediately after graduation he commenced practical work among the railroads of the west. His principal experience was in conection with the laying out and building of the Northern Pacific. Mr. Field had charge of the locating and building of the branch connecting the Yellowstone National Park with the Northern Pacific. In 1882 he was appointed superintendent of bridges in the city of Philadelphia, which position he held for something over a year, when he resigned to accept a position as assistant engineer of the Berlin Iron Bridge Company, of which he became, in time, vice president with general charge of all the sales.

Mr. Field had no small part in the making of the eneviable reputation which this company now enjoys, and his death will be a severe loss to his associates. In the very flush of manhood, when everything in the world seemed brightest and best to live for, he was cut off in an instant. He was an indefatigable worker not only for the Company which he had so faithfully served, but in everything he undertook: a true friend of his fellow men, a devoted and earnest worker in the Church, a staunch friend to the cause of temperance; active and energetic in every public position that engaged his attention. Mr. Field had most pleasing manners, and was so honest in all his dealings that he had an enviable reputation among the manufacturing corporations of the country. He is survived by a wife and two small children.

Calendars.

Charlotte Machine Co., Charlotte, N. C., H. S. Chadwick, president and treasurer, has issued a calendar for 1898, with a portrait of a Southern maiden, such as we presume work in the cotton mills of the South, and if so, show a high degree of vivacity and intelligence for an ordinary mill operative.

Merchants' Sample Card Co., 79-81 Crosby St., New York. We are indebted to this company for a useful calendar for 1898.

The Whitin Machine Works, Whitinsville, Mass., have sent us a card calendar of theirs for 1898, with illustrations, showing their factory and a number of their leading machines.

Sykes & Street, dealers in dyestuffs, New York, have favored us with one of their 1898 calendars, leather bound, suitable to place upon the desk. It is one of the neatest and most convenient desk ornaments that we have been privileged to receive.

Philadelphia Museums.

William Harper, chief of the Bureau of Information, of the Philadelphia Commercial Museums, recently returned from a trip around the world, as a special commissioner of the Museums, to the chambers of commerce and other commercial organizations of South Africa, Australia, China and Japan. During his six months' absence, Mr. Harper visited every chamber of commerce, board of trade and other commercial organizations of any prominence in the principal cities of the countries that he visited and succeeded in making reciprocal arrangements with nearly every organization visited, and has the assurance that not only will these organizations appoint representatives on the International Advisory Board of the Museum, but most of them will send representatives to the meeting of the International Advisory Board next October, when the Exposition of the Manufactured Products of the United States will be open in this city.

Recent Sales of Mill Stocks.

	Lowest.	Highest.
Lowell Mfg. Co.	525	527
Amoskeag	1300	1400
Appleton	275	300
Cocheco	173¾	177½
Middlesex	119¼	119½
Laconia	560	597½
Shove	•97	100
Cornell	107½	107½
Globe Yarn	75	75
Hargreaves	100	100
Sanford Spinning	90	90
Merrimack	925	950
Great Falls	127¾	132¾
Edwards	140	147
Atlantic	44¾	45
Hamilton	650	680
Lyman	55¼	60
Essex Co.	133¼	133¾
Pacific	1860	2000
Pepperell	1255	1275
Hamilton Woolen	40	40
Manchester	100	101¼
Dwight	797½	797½
Granite	95	95
Union Mfg.	145	145
York	600	602½
Lawrence	106	107¼
Narragansett	95	95
Sagamore	95	95
Naumkeag	50	50
Massachusetts	92¼	92¼
Amory	129½	129½
Bates	104⅞	104⅞
Continental	15	15
Everett	55¼	55¼

—The twentieth triennial exhibition of the Massachusetts Charitable Mechanic Association will be held in the Mechanic Building, Boston, in the fall of 1898. This is one of the events in the machinery world, and its exhibitions have always

contained a goodly representation from the textile machinery and mill supply trade. The details and general arrangements for the exhibition have now progressed so far that correspondence with manufacturers is invited.

—Theodore G. Beckert, designer for the Waverley Woolen Co., Pittsfield, Me., has commenced an evening course of instruction in textile manufacture, at Pittsfield, for those who desire to receive it. Mr. Beckert is a graduate of a high school of designing and manufacturing, at Werdan, Saxony, and earned the first diploma for original designs in color combination. He has been a designer in some of the largest mills in Europe and in this country.

Record For 1897.

Messrs. George S. Harwood & Sons, 53 State St., Boston, Mass., announce that over 97 per cent. of all the new woolen cards built in this country in 1897, were started with Bramwell and Apperly feeders. Besides these two well known appliances, their line includes the Bramwell picker feeders, in two styles, for burr and mixing pickers, also fearnaughts; the new 1897 Bramwell opener and feeder (a complete machine), for wool washers and dryers, and they are sole agents for the Spencer automatic stock oiler and the Woodbury clutch attachment for Bramwell feeders.

MILL NEWS.

Cotton.

New Mills.

—*Alabama, Tallassee. Watkins & Hardaway, engineers and contractors, Tallassee, Ala., who are building the mills for the Tallassee Falls Mfg. Co., inform us that the buildings are well under way, and the water power development is a very heavy piece of work, which will require about twelve months yet to complete. The new mills will probably be running by January 1, 1898. C. R. Makepiece & Co., architects; Hermon Alber, Birmingham, Ala., engineer of construction; and W. H. Micon, Jr., Montgomery, Ala., secretary of the company. This mill will have 50,000 spindles.

—Arkansas, Blackford. L. C. Way is getting information regarding a cotton mill which is proposed for this place.

—Arkansas, Little Rock. Maxwell Coffin and others are negotiating with the Board of Trade for the establishment of a cotton mill here.

—*Georgia, Dawson. Regarding the proposed new Cotton Rope Mill, A. J. Baldwin & Co. inform us they have not quite decided to build, but are making inquiries as to the cost of machinery. They would like to get as much information on the subject as possible. Their present business is hardware, furniture and general merchandise.

—*Georgia, Douglasville. The Georgia Western Cotton Mills now inform us that they expect to have their plant ready for starting next Autumn. Equipment will be 20,000 spindles, 500 looms, steam power. They will make sheeting, duck and drills. Capital stock $350,000. President, J. S. James; treasurer and manager, Samuel Hale; superintendent, W. E. Robinson.

—*Georgia, Harmony Grove. Regarding the new cotton mill for this place, G. W. D. Harber informs us that he and his brother W. T. Harber sold their interest in the Harmony Grove Mills for the purpose of building a new mill here of 5000 spindles and 200 looms. They are to furnish $60,000 capital and a South Carolina party $40,000 capital.

—*Georgia, Rockmart. It is reported that Colonel John O. Waddell, of Atlanta, has accepted the proposition from New York capitalists to sell his estate for a cotton mill and bleachery. It was understood that a large 2-story brick building with offices and engine room will be built. The location is at Long Station, 4 miles from Rockmart. We presume that the purchasers are the officers of the New York Mills, who have been considering the building of a 15,000 spindle mill in this vicinity, as mentioned last December under "Rome, Ga."

—Georgia, Rossville. There is a movement in this vicinity for the establishment of a new cotton mill, for which it is expected woolen mill owners in this neighborhood will subscribe stock. The mill will probably produce cotton warps, to be sold to the woolen mills. George Hardwick, of the Cleveland Mills, is among those who are said to be interested.

—Maryland, Pocomoke City. A committee has been appointed to investigate the advisability of establishing a cotton mill here, made up as follows: W. S. Dickinson, F. M. Wilson and Elijah J. Schofield.

—New York, Cohoes. Ellis Bros. have placed machinery in the old Tubbs Building and will soon commence the manufacture of towels.

—*North Carolina, Fayettville. The Holt-Williamson Cotton Mfg. Co. has been incorporated, capital stock $60,000, by W. H. Holt, E. H. Williamson, L. E. Williamson, J. W. Menefee and Herbert Lutterloh, all of Fayettville. This company will operate the Phenix Mill, which we recently reported had been bought by Edward Williamson.

—North Carolina, Lincolnton. M. S. Rudisill and others have built the Indian Creek mills here. They have a water power sufficent to operate 8000 spindles, or 4000 spindles day and night. The mill is not yet equipped with machinery, and they now desire some experienced mill man to take one-half or one-quarter interest, and start the plant with 2000 spindles.

—*Pennsylvania, Chester. T. I. Birkin & Co., who are moving their Philadelphia plant to Chester, Pa., inform us that they expect to start the new mills April 1. They will make Nottingham lace curtains and drapery nets, employing 125 to 150 hands. Steam power; with bleach house. This firm also has branches in Nottingham, Eng., Glasgow, Scotland,

and Oelsnitz, Saxony. J. W. Smith is manager at Chester. Their New York selling agents are J. A. Brittain & Co., 434 Broadway.

—Pennsylvania, Norristown. James C. Potter, who recently withdrew from the Howard & Bullough American Machine Co., of Pawtucket, R. I., has bought land of Theodore Carey at Ivy Rock Station, near this city, and will establish here a large Textile Machine Works. Mr. Potter is now in England making arrangements with English manufacturers for building their machinery. It is Mr. Potter's intention to build and operate a 10,000 spindle cotton mill on the same property, equipped with his machinery, which will make high grade hosiery yarns. His land is crossed by both the Reading & Pennsylvania Railroads.

Enlargements and Improvements.

—*Alabama, Florence. There is another report current that the Cherry Cotton Mills are to spend $15,000 on new carding and other machinery, and that Superintendent N. Brandon has already started for New England to buy machinery.

—Connecticut, Putnam. The Putnam Mfg. Co. expects to start its new machinery during Jan. 7,000 spindles will be moved from the Ray Cotton Mills in Woonsocket, which have been shut down permanently. 6,240 spindles will be new Mason spinning frames, which increase the capacity 13,240 spindles. New spoolers and warpers will be put in. 432 more looms will be set up in the new weave shed, making a total of 864 looms.

—Maine, Augusta. The Edwards Mfg. Co. is putting in 108 new Northrop looms, replacing some of their old looms.

—Massachusetts, Clinton. The Lancaster Cotton Mills whose water power has been taken by the Metropolitan Water Works, is building a new boiler and engine house and has ordered a new Corliss engine which will probably be installed by the end of March.

—New York, Utica. The Utica Steam Cotton Mills are gradually changing the looms for yarn machinery. This change is owing to a better demand for yarn than for cotton cloth. There will be quite a number of the operatives discharged since the new manufacturing line does not require as many hands.

—North Carolina, Burlington. The Glencoe Cotton Mills have recently installed new equipment at their dyeing plant.

—North Carolina, Charlotte. An addition is being built to the towel mill of the Crowley Manufacturing Co.

—*North Carolina, Davidson. The Linden Cotton Mills are said to be about to put in still more machinery, and an increase in capital stock of $10,000 is also reported.

—South Carolina, Marion. The Ashby Cotton Mills, A. M. Price, proprietor, will put in 100 new frame spindles and 500 twister spindles, also slubbers, speeders, reels and warpers. A new addition has been built to accommodate this equipment.

Mills Starting Up.

—Nebraska, Kearney. The Kearney Cotton Mills started up Jan. 3, having been idle since last summer. It was reported that they were to start last November, but they did not.

—Rhode Island, Providence. The mill of the Dyerville Mfg. Co., which shut down November 1, resumed operations last week. During the three months of idleness, new carding machinery, pickers and lappers, have been put in. The mill has been put in thorough repair.

—*Vermont, Burlington. Operations were resumed January 24th. in the mills of the Queen City Cotton Co. after an idleness of two weeks. The first strike against the general retrenchment policy of manufacturers, was made by the operatives at this mill.

Mills Shutting Down.

—Maine, Biddeford. All departments of the Pepperell and Laconia mills of Saco, are shut down on account of the strike.

—New Hampshire, Manchester. The Manchester Cotton Mills, which are to make a cut of ten per cent. in wages Jan. 24, will also stop 1140 looms in their printing department on Feb. 1.

—Rhode Island, Arcadia. The Arcadia Co., manufacturers of print cloths, have shut down probably for a long idleness.

Woolen.

New Mills.

—*Illinois, Harvey. The Woolen Mill Co. which we reported last November had been incorporated at Chicago with $15,000 capital stock, by Walter S. Burnham, D. H. Champlin and C. D. Tuthill has purchased the equipment of the Kimball Woolen Mfg. Co.'s mill at Bowling Green, Mo., and will have same removed to this place. There are 4 sets of cards. We note that D. H. Champlin of the new company was treasurer of the Kimball Woolen Mfg. Co.

—Massachusetts, Spencer. M. J. Manning, who operates a grist and cider mill here, will probably put in equipment for a shoddy mill, the product to be used by the Spencer Woolen Co. Mr. Manning's plant was at one time used for making shoddy, by Charles Aldrich.

—*Michigan, Sault St. Marie. J. G. Griffith, of Pickford, Mich., who is building the woolen mill here, expects to have the same completed next May. The structure will be 24x60, and will probably make yarns, blankets and flannels. Custom work mostly.

—*New Hampshire, Goff's Falls. The Devonshire Mills are moving their machinery into their new building which is 54x230, 3 stories and basement. The new mill will soon be ready to start.

—New Jersey, Blackwood. The mill at this place, for many years known as Ayers Mills, is to be repaired and refitted and will begin the manufacture of satinets, which is what the mills made in the past. We have not been able to learn the names of the interested parties.

—*New York, Newberg. The Plattekill Felting Co., which we recently mentioned, inform us that their's is a new concern, and they expect to start their plant about March 15, 1898; work on the building has just been started. They will have 2 sets of woolen cards, will use steam and water power, making saddlery felts, and employ 17 people. Capital stock $25,000. William Foster, president;

James S. Taylor, treasurer; superintendent, K. J. McLeod; selling agents, S. Strorck & Co. The necessary machinery is bought.

—New York, Niagara Falls. Alexander Morton & Co., Canadian carpet manufacturers, will locate here, employing 300 to 400 hands. They will take power from the Niagara Falls Power Co., who have closed contract with them.

—Pennsylvania, Chester. The Dawson & Marsden Co. recently started up the Delaware Front Shoddy Mills, Third & Hinkson Sts., on woolen flocks, woolen and cotton waste.

—*Pennsylvania, Chester. The new company to operate a woolen mill here under the name of David Armitage & Son from England, will probably start the mill in March, employing about 150 hands. They will make ladies cloakings. Capital of this concern is furnished by Englishmen. R. E. Ross of Chester, Pa. is closely connected with this enterprise.

—Pennsylvania, Chester. There is a prospect of another worsted mill for this city. George Hirst, of George Hirst & Son, Britania Mills, Birsdale, near Leeds, England, and T. E. Middlebrook, of Brook, Milford & Co., Batley, England, have been in this city recently and with R. E. Ross have been negotiating for a lease of the No. 3 mill of J. P. Crozer & Sons, of which Samuel Lyons is agent. This is known as Gartside Mill. The mill is very much out of repair and we understand that satisfactory terms have not as yet been arrived at.

—*Pennsylvania, Philadelphia. The Brighton Mfg. Co. is the name of the new company operating the worsted mill, cor. Howard and Palmer Sts. It was started in Nov. '97, employs about 30 and has 16 broad looms, with provision for 4 more. The product is men's wear worsted suitings.

—Pennsylvania, Scranton. Arrangements are being made for the location of a carpet factory in this city by H. A. Porter, general salesman of the Stroudsburg Carpet Company. The plant will employ about 150 men and boys. A free site has been offered by the owners of the Tripp land.

—*Rhode Island, Woonsocket. Regarding the new plant of the United States Rubber Co., we now have information that they will equip this plant for a ten-set mill, the machinery coming from the Fernbrook Carpet Co., of Yonkers, N. Y., which they have bought, consisting of carding, spinning and knitting. They will make knit boots and fleece lining for rubber goods. The stone mill and the brick mill, formerly occupied by the Bannigan rubber works, are now being put in repair.

—South Carolina, Gaffney. A carpet mill will be erected here to be the first one built south of Baltimore. Stock has nearly all been taken and it is expected to begin operations in a short time. The following directors have been appointed: J. A. Carroll, H. D. Wheat, F. D. Stacy, L. Baker, J. G. Wardlaw, J. Q. Little and S. L. Cutting.

—Tennessee, Madisonville. G. O. Bicknell, Bicknell Block, Madisonville, is investigating cost and equipment of a woolen mill making flannels and cassimeres. A company with a capital stock of $50,000 is proposed.

—Virginia, Jacks Mill. John T. Price will utilize the water power near this place, and will form a company to erect and operate a woolen mill.

—*Virginia, Winchester. C. A. Williams & Bros. inform us that they will rebuild their woolen mill which was recently burned, and expect to start up their new plant about the first of August. It will have one set, seven cards, eight looms, dye house, steam and water power, and will produce prison and reformatory goods, employing twenty to twenty-five hands.

Enlargements and Improvements.

—Iowa, West Point. The West Point Woolen Mills have been leased by the stockholders and will hereafter be under the management of an organization with F. Kreikenbaum as president; J. A. Kreikenbaum, secretary and treasurer, and T. C. Newby, general manager. An addition will be built and new machinery installed. They expect to start operations March 1st.

—*Kansas, Topeka. The new Topeka Woolen Mill Co., which started last month, employing about 50 hands, now contemplates increasing to its full capacity, which will give employment to about 100.

—Massachusetts, Fitchburg. The Grant Yarn Co. have put up an addition 75x45 feet; three stories.

—Massachusetts Fitchburg. The Fitchburg Worsted Co. have built an addition 110x32 feet; two stories.

—Massachusetts, Hinsdale. The Hinsdale Woolen Co. will put in two 108-inch Knowles looms. This will give them a total of 85 looms.

—Massachusetts, Saxonville. The Saxonville mills are putting in six new looms which it is thought will be run on blankets.

—*New Hampshire, Tilton. In reference to our recent report, E. G. & O. G. Morrison inform us that they have leased the Britain Mfg. Company's property, and as soon as that company builds their additional building, they will occupy the same with their present machinery, now in the Elm Woolen Mills and Morrison shoddy mill. There will be no increase of machinery.

—North Carolina, Waynesville. The Richland Woolen Mills, D. Drayton Perry proprietor, will probably put in small dyeing plant, add a new weave room and improve the carding machinery.

—*Oregon, Salem. The last of the new machinery to be put in by the Thomas Kay Woolen Co. has arrived. It consists of two mules and one set of cards. It is also stated that the company intends to erect in the spring a brick addition to its main building, 36 x 60 feet, two stories to be used for weaving and finishing.

—Pensylvania, Bridgeport. The Sterling Mills Co. are installing 20 new broad looms to take the place of some of older style.

—Pennsylvania, Philadelphia. Thomas Wolstenholme, Sons & Co., northwest corner Frankford Ave. & Westmoreland Sts., are to build a five story brick addition. Wm. Steele & Son have the contract.

—Utah, Hyrum City. The Hyrum City Woolen Mills have closed down for the purpose of making extensive improve-

ment. Over $3000 worth of new machinery is to be installed, thus greatly increasing the capacity

—Wisconsin, Janesville. $7,000 will be spent at once by the Rock River Woolen Co. for improvements. The contract has been let to James Shearer for the erection of a two story brick addition that will adjoin the present mill at Monterey. This addition will be 30x60 feet will be fitted on the second floor with the latest improved spinning machinery, same having been ordered from Worcester, Mass. Total cost of the building and machinery will be about $47,000. 70 hands are at present employed, and business has been so rushed of late they have had to work over hours.

Mills Starting Up.

—Connecticut, Moosup. Operations were resumed on full time in the woolen mill of Milner & Co. The wages will be the same as paid in 1893.

—Connecticut, Norwich. The Norwich Woolen Mills have recently been bought by parties who will operate them under the name of the Otrobando Woolen Co. Capital stock, $30,000. The following hold the stock at $100 per share: W. H. Faunce, Camden, Me., 100 shares; A. F. Maxwell, Meriden, Conn., 60; T. J. Maxwell, Meriden, Conn., 40; Charles Bard, Norwich, 50; T. J. Maxwell, trustee, Meriden, 50. The mills will be started up soon, employing about 200 hands.

—Connecticut, Woodbury. The 3 set Woolen Mill operated by Daniel Curtiss Sons, has been started on full time. Mill recently has been running only half time.

—*Massachusetts, Spencer. The Red mill has been started up by the Spencer Woolen Co., Newton Darling, manager. 35 hands were employed running at full capacity.

—Rhode Island, Bridgton. It is reported that Gilleran & Hardy will operate the mill formerly under the management of W. H. Prendergast, of Pascoag. They will take a lease of the two upper floors of this mill, and employ about fifty hands, making worsted cloth.

—*Rhode Island, Hope Valley. The Hope Valley Woolen Co. is the name adopted by H. R. Sayles, J. E. Sayles of Uxbridge, and Charles H. Woodbury to operate the Owen Mill, of this place. They expect to start February 1st. At present the plant is undergoing thorough repair. Their equipment consists of four sets of woolen cards, fifty looms, dye house and the product will be cotton warp, piece dye woolens.

—Rhode Island, Slocumville. B. A. Clarke & Co. owners of the Yaw Goo Satinette Mill which is a 2 set plant with 14 looms started up recently. The mill has been idle for about two years.

—Utah, Ogden. The Ogden Woolen Mills, which have been shut down on account of the cold weather, have again resumed operations with a largely increased force. These mills have large orders for blankets from the East and other classes of goods are in great demand from places beyond the Missouri.

—*Virginia, Bedford City. Our recent report regarding the Liberty Mill is now confirmed. It is stated that a syndicate, in which Henry T. Kent, of Thomas Kent Mfg. Co., Clifton Heights, Pa., was principal owner, has purchased this property, and that the mills will probably be started soon.

Knit.

New Mills.

—*Connecticut, Newington. The Newington Novelty Knitting Factory is now equipped, and ready to run at its full capacity. At present it employs over 20 girls. Capital stock of $25,000 has been subscribed, with the exception of but $9,000. When this balance of stock is taken up, the factory will be started up in full, employing about 250 girls. A specialty will be made of children's plaid stockings, breakfast shawls, baby carriage robes, and athletic goods.

—*Georgia, Athens. Jas. H. Dootson, William Dootson and A. H. Hodgson, who are to start a new knitting mill here expect to begin work about March 1st; foundation for new building has just been started. The product will be knit underwear and hosiery also pants, shirts and drawers, not knit. Will have 40 full automatic machines, use water power and employ about 40. Machinery is bought.

—*Georgia, Rossville. The Rossville Hosiery Mill is expected to be completed about the first of April. The general contract has been awarded to J. E. White. This is a new company, reorganized from the Chattanooga Knitting Mill, recently mentioned. Capital stock, $50,000. President, E. G. Richmond; vice-president, G. W. Davenport; treasurer and manager, Garnett Andrews, Jr.

—*Massachusetts, Northampton. The McCallum Hosiery Co. which has been located in Belding Bros. Silk Mill, will make all kinds of high class silk hosiery, employing twenty-five to fifty hands. They started Dec. 1, 1897, with 25 knitting machines. The company has a capital of $50,000. President and manager A. McCullum; treasurer, B. McCullum. They sell direct. They succeeded to the hosiery department of Belding Bros.

—*New York, Dolgeville. Regarding the proposed new knitting mill, it is now reported that capital stock will be $15,000, raised partly by popular subscription, and among the interested parties are mentioned John McCauley, proprietor of the Beaver Knitting Mills, at Little Falls, N. Y.

—*New York, New York. The Continental Golf Stocking Mfg. Co., 46 East 14th St., New York, expect to start their new plant by March 1, using electric power. They will have 50 knitting machines. Capital is $100,000. President, Z. Gordon Wood; treasurer, James F. Mullen; superintendent, Frederick H. Moon. They will manufacture sporting goods, bicycle, golf and fancy stockings. They will not have a dye plant.

—*New York, St. Johnsville. J. H. Reaney formerly of the Lyon Knitting Co. is starting up a new plant here under the name of the Royal Knitting Co. He will employ about 250 hands, and will make ladies ribbed goods; also children's and misses, running 75 machines by steam power.

—*North Carolina, Roanoke Rapids. Roanoke Underwear Co. started its mill January 3, with full force. This company has a capital of $100,000. James A. Pugh is treasurer and general manager.

—Ohio, Findlay. The Business Men's Association of this place is trying to secure the location of a branch mill of the Jackson Knit Goods Works, of Fremont, Ohio. O. A. Ballard, L. W. Eoff, and

Max Morehouse were appointed as committee to conduct negotiations.

—Pennsylvania, Downington. A hosiery mill is being put up by Charles W. Walker and P. Frank Evans, located on Jefferson St.

—Pennsylvania, Fleetwood. Klutz Bros., proprietors of the Clover Leaf Knitting Mill, contemplate erecting a large stone mill in the spring.

—*Pennsylvania, Harrisburg. The new hosiery mill in which P. H. Lamey of Wisconsin is interested will be located on Seventh St. between Maclay & Woodbine Sts. Contract has been let to George L. Sellers, 1921 N. 4th St., and calls for a building 30x60, two stories, and plant will probably be started up about Feb. 15th.

—*Pennsylvania, Hawley. H. Nollan, proprietor of the United States Knitting Mills, which were destroyed by fire December 1897, has started excavations for his new building which will be of brick, 30 x 100.

—*Pennsylvania, Lititz. This month work will begin in the Keystone Knitting Mill just two months after the ground was broken for the building. A frame structure has been erected 60x32 feet and 2 stories high. Nye & Tredick of Philadelphia furnished the knitting machines, which are 7 in number, 5 knitters and 2 sleevers. Ladies' underwear will be made. F. W. Briggs of Little Falls, N. Y. is here to teach the knitters. The company consists of Samuel Erb, president; A. B. Long, secretary; I. G. Erb, treasurer and F. B. Buch engineer and general manager.

—*Pennsylvania, Mahanoy City. It is reported that if 20 shares at $50 a share can be subscribed, work will be commenced immediately upon the rebuilding of the Eagle Hosiery Mill, which was destroyed by fire in January. With the amount of new stock raised and the insurance on the plant, it is estimated that a plant can be erected the size of the one burned.

—Pennsylvania, Middletown. H. A. Romberger, hosiery manufacturer, 2330 North 18th St., Philadelphia, Pa., expects to establish a new hosiery mill, making high grade seamless half hose, and ladies' hose. It is not definitely decided that Middletown will be the location. The equipment will be first class.

—Pennsylvania, Mont Alto. A local paper states the knitting plant of Oscar S. Riley will be moved to this place about March 1st. A building will be furnished Mr. Riley at a very low rent and will become his at the end of five years. At present he employs about 25 hands, making cotton half hose with 18 knitting machines and 2 sewing machines.

—*Pennsylvania, Nanticoke. It is now reported that H. C. Fairchild has purchased ground on East Church St. for the erection of a new knitting mill. Work will be started this week on the building, which is to be 70x40 feet, 3 stories, giving employment to 200 hands.

—Pennsylvania, Philadelphia. The Brown Knitting Co. is the name of a company recently chartered to manufacture hosiery and knit goods. Capital $50,000. Directors, Thomas E. Brown, Henry Brown, W. Park Moore, Wm. M. Addis, Frederick Rumpf, senior.

—*Pennsylvania, Shamokin. The new hosiery mill at this place started January 13, employing about 75 hands, on fine gauge seamless hosiery. They have 40 knitting machines; use steam power, sell direct. This is a new concern doing business under the name of Kline & Ressler. The members of the firm are N. R. Kline, formerly overseer for I. W. Forry & Son, of Shamokin, and S. L. Ressler, a progressive business man of this place. Their mills are called the Shamokin Valley Knitting Mills.

—Pennsylvania, Tower City. Boyer & Romberger will start a hosiery mill here, making ladies fast black goods, 176 needle. They will have five Mayo full automatic machines, one Boss ¾ automatic, one looper, one welting machine, steam press, will use steam power and sell direct.

—*Pennsylvania, Wallingford. The new building of the Columbia Hosiery Co., at Todmorden, a suburb of Wallingford, is now nearly completed. The steam plant will be put in soon. The new building is 20x50.

—*Pennsylvania, York. The new plant of the York Knitting Mills previously mentioned has started up, employing about forty hands, which will be largely increased before long.

—*Texas, Crockett. Shivers Bros. are investigating the cost of hosiery mill equipment, with a view to starting a plant here.

—*Texas, Cuero. B. Fish is attempting to raise about $700 towards starting a small knitting plant here. A local paper reports that nearly all of this amount has been secured.

—*Wisconsin, Stevens Point. H. S. Blake & Co., proprietors of the Racine Knitting Co., Racine, Wis., expect to start up their branch here in about a month. 52 knitting machines and 13 ribbers have arrived, and are being set up in the new building.

Enlargements and Improvements.

—*Connecticut, Madison. The Lenox Knitting Co., who have succeeded to the business of H. J. Griswold, are operating 24 knitting machines, making golf and bicycle hose, ladies' hosiery, and men's half-hose. H. J. Griswold is superintendent, John J. Kelly, president and treasurer. Their capital is $5,000. They have no dye-house. The goods are sold by John J. Kelly, No. 36 South First St., Brooklyn, N. Y.

—*New Hampshire, Franklin. At the Sulloway Mills, the finishing department will probably be moved to the new building recently completed. The new German knitting machinery is now in operation here.

—*New Hampshire, Laconia. At the Hodgson & Holt Mfg. Co., the mills have been shut down for six weeks. Considerable new automatic knitting machinery will be put in.

—New York, Perry. Additional machinery has been installed in the plant of the Perry Knitting Company. Work will soon commence upon the erection of a large new building 30x80 feet.

—Tennessee, Lenoir. The Dixie Mills are putting in some new machinery, which will make their total production 600 dozen hose per day. They are now running on black and solid color goods, made from Southern yarn, but their new machinery will be run on lisle-thread goods. They expect to employ a night force, and have sold their product about four months ahead.

Mills Starting Up.

—Connecticut, New Britain. The mills of the New Britain Knitting Co. started up last month, after a long idleness.

—Connecticut, Norfolk. The Norfolk & New Brunswick Mills, which have been shut down since Jan. 1st, will resume operations Feb. 15th.

—*Massachusetts, Wakefield. The new building for the Hartford Knitting Mill, of which Winship Bolt & Co. are proprietors, was not ready for occupancy Jan. 1st, but it is expected that the machinery will be moved in and ready to start up sometime this month.

—*Minnesota, Mankato. The Mankato Knitting Mill resumed operations Dec. 27th, under the management of assignee Moffat. It is understood that the mills will be sold in the near future.

—Minnesota, Rushford. The Rushford Knitting Mills which assigned last month, have been purchased by J. C. Nutting, of Rushford, who will start the plant soon. Mr. Nutting is a business man of recognized ability, and it is expected that the plant will be successful.

—New Hampshire, Laconia. A local paper reports that the Guilford Hosiery Mills, which have been idle for several years, may be started up under the management of New York parties.

—*New York, Baldwinsville. The knitting mill of J. C. & J. C. Miller has started up in several departments and will soon be running on full time, employing about 200 hands. Mr. Johnson, formerly of Herkimer, is superintendent.

—*New York, Rockton. We are able to confirm our previous report that the Red Star Knitting Mill has been leased by the Eagle Knitting Co., of Rockton, and both mills are being run under the same management; W. H. Rowe, president; W. H. Rowe, Jr., treasurer; B. Lewis, secretary; Frank E. Wilson, superintendent. No additions have been made, and none are contemplated. The product of the Red Star Mill is fleece, flat underwear and overshirts.

—*New York, Sherburne. It is now reported that C. Farrel, Allis & Co., underwear manufacturers, of Utica, N. Y., will operate the Sherburne Knitting Mills, putting in new machinery and making other improvements. David M. Farrel will be superintendent.

—*New York, Troy. The Troy Knitting Co. has been incorporated with a capital stock of $100,000. Incorporators are Thomas Breslin, Charles H. Cavanaugh, Michael Organ, of Waterford, Peter McCarthy, Charles Mahoney, James F. Cowee, Wm. C. Geer, Wm. H. Rowe, and Richard Everingham, of Troy. This company will operate the plant formerly owned by the Wynantskill Knitting Co. The machinery will be put in, and the plant started as soon as possible.

—Pennsylvania, Hellertown. The stock and machinery of the Saucana Knitting Mill, formerly occupied by A. F. Woodring, was purchased recently by George A. Vosburgh, of Johnstown, N. Y., who will put the mill in operation at once. He will manufacture ladies' woolen underwear. Fifty hands will be employed. The building and power plant are owned by the Hellertown Improvement Co.

—Pennsylvania, Scranton. The Lackawanna Knitting Mills, which have been running irregularly for some time, have resumed work with night operators in the carding, spinning and knitting departments.

Silk.

New Mills.

—*Connecticut, Shelton. A. & S. Blumenthal will occupy the building vacated by the Franklin Brass & Bronze Co., on the Birmingham canal, until their new factory is completed. Work is being rapidly pushed on the new plant.

—*New Jersey, Paterson. We now have authentic information from Walter H. Graef & Co., importers and commission merchants, 450 Broome St., New York, regarding the new silk company here. This is the Audiger & Meyer Silk Co., which has been incorporated with $100,000 capital. Julius Meyer is president; Walter H. Graef, treasurer; Albert Meyer, secretary. The principal stockholders are: The Bergisch Maerkische Industrie Gesellschaft, a large financial institution of Marmen, Germany; Audiger & Meyer, Crefeld; Walter H. Graef & Co., New York. The latter firm will be the selling agents. A factory, with the latest improvements, will be erected for them in Paterson, and they will devote themselves principally to the manufacture of the highest class tie silks. About 200 hands will be employed.

—*Pennsylvania, Charleroi. Bamford Bros.' Silk Mfg. Co., of Paterson, N. J., will erect a 4-story brick building, 62x204 feet, to cost $70,000, at this place, in April. It is expected to have the plant in operation early in the fall, when employment will be given to 1100 boys and girls. The value of the machinery to be installed will be about $100,000.

—*Pennsylvania, Cheltenham. E. F. Pike informs us that he expects to start his new mill here, which he calls Sunnyside Mills, by April 1st. The product will be chenille table covers. Machinery from his present mill in Philadelphia, Second St. and Columbia Ave., will be moved to this Cheltenham mill. He will put in six new looms, which will give a total of 38 broad looms. He has not yet decided whether he will put in a dyeing plant. He will not probably settle this question for six months. He expects to employ from 75 to 100 operatives, and use steam power. He is in the market for electric motors, lighting apparatus, tanks, hose and automatic sprinklers. Selling agents are Bosset, Pere & Fils, No. 47 White St., New York.

—*Pennsylvania, Pittston. It is expected that the new silk mill at this place will be in full operation by the first of March, giving employment to two hundred hands, mostly girls. This is the plant of Frost & Van Riper, who are now having the machinery installed in the plant.

—*Pensylvania, Quakertown. The new silk mill of the Eagle Silk Co. will start up February 1st, with I. D. Hughes as superintendent. As previously reported this building is 145x45 and cost about $20,000. I. L. Lehr & Son of Allentown had the contract.

—Pennsylvania, South Bethleham. The silk manufacturing firm of Duplan & Co., of Lyons, France, will probably establish a branch mill here. They will probably have about 200 looms at the start, and can be enlarged to double this capacity. It is reported that a mill building has already been bought at South Bethleham.

—Virginia, Newport News. The establishment of a silk mill is being agitated. Frederick A. Keeler, of Frederick, Va., is the leader in this movement. Maj. W. A. Post, W. B. Vest, J. M. Curtis, J. R. Swinnerton, and others, are said to be interested. $75,000 is talked of as the amount of capital. The mill will employ about 150 people.

PERSONAL RECORD.

Cotton.

—C. B. Arnold, recently employed by the Grosvenordale Co., of N. Grosvenordale, Conn., has accepted a position as draughtsman for the Whitin Machine Machine Works.

—George Bartlett, of Riverpoint, has been appointed superintendent of N. Situate cotton mill, in place of Edward Sweet who resigned January 1.

—A. E. Bosworth, overseer of carding at the Bernon Mill, Georgiaville, R. I., for the last two years, has resigned his position to accept a similar one at Ashton.

—Wm. Cameron, who has been at Chester, S. C., has taken a position as overseer of dyeing at Fort Mill, S. C.

—J. T. Carter, has resigned his position in the spinning department of the No. 3 Clifton mill, Clifton, S. C., and will take a position as second hand in the card room of the American Spinning Co., Greenville, S. C.

—D. E. C. Clough, who has been overseer of carding and spinning, and also assistant superintendent of night work, with the Beaumont Mfg. Co., Spartanburg, S. C., has taken a position as overseer of spinning with the Pacolet No. 1 mill, Pacolet, S. C.

—George Cook has resigned his position as boss carder in Harmony Mill No. 3, Cohoes, N. Y., and will hereafter take charge of the mill of S. E. Clifton & Co., Cohoes.

—Alexander G. Cumnock has resigned as agent of the Boott Cotton Mills, Lowell, Mass., where he has been for 31 years. His eldest son, Victor I. Cumnock, has been elected in his place.

—Charles T. Daniels has resigned as overseer of the cloth room of the Pemberton Mills, Lawrence, Mass.

—A. G. Dockett who recently resigned as overseer of spooling and spinning in the Manville (R. I.) Mills, has accepted a similar position in a large Utica (N. Y.) cotton mill. He will be succeeded by Henry Wiley, of Fitchburg, Mass. Mr. Dockett was presented with a cut-glass bottle and silver shaving set, from the employees.

—John Driscoll has taken a position as day watchman with the Harmony Co., Cohoes, N. Y.

—Smith Evans, who has been employed by the Blackstone Cotton Mill, Blackstone, Mass., for 44 years, has severed his connection with the mill.

—J. J. Feeley has taken a position as electrician at the Manton mill, Manton, R. I.

—J. W. Goodroe, who has been spinner at the No. 1 Exposition Mill, Atlanta, Ga., has resigned and gone to Covington, Ga., where he has a similar position with the Porterdale Mills.

—Henry A. Green has resigned as boss carder at No. 3 mill, Voluntown, Conn., on account of ill health.

—Charles E. Guild has taken a position as superintendent of the Millfort Cotton Mill, Fort Mill, S. C. He was formerly at Toccoa, Ga.

—George P. Hall has taken a position as overseer of carding and spinning with the Sylvan Cotton Mills, Shelbyville, Tenn.

—J. B. Harkey has resigned his position as card grinder at the Peoples' Cotton Mills, Montgomery, Ala., and takes a position as superintendent of the rope and twine mills at the same place.

—Thomas Harvey, of Graham, N. C., has accepted the position of overseer of carding at the Maginnis Cotton Mills, New Orleans, La.

—R. C. Hawkins has resigned his position as night superintendent with the Linden Cotton Mills, Davidson, N. C., and taken a position as overseer of beaming in the Hope Mills Cotton Mills, Hope Mills, N. C.

—G. F. Howard has secured a position as overseer of spinning with the Edna Cotton Mills, Reidsville, N. C. He was formerly with the Fulton Bag & Cotton Mills, Atlanta, Ga., where he had been for nine years.

—John Holland has taken a position as section hand in the spinning room of the Overland cotton mill, Overland, Col. He was formerly with the Maginnis Mills, New Orleans, La.

—Jesse Hord has resigned as overseer of the cloth room at the Lanett Cotton Mills, West Point, Ga., and is succeeded by James Nolan, who has been second hand.

—J. A. Hudson, who has been with the Fulton Bag & Cotton Mills, Atlanta, Ga., is now with the Edna Cotton Mills, Reidsville, N. C.

—G. F. Ivey is to resign his position as superintendent at the Bessemer City Cotton Mills, Bessemer City, N. C.

—J. T. Jackson has taken charge of the Oxford Cotton Mill, at Oxford, Ala.

—William L. Jenkins, who has been overseer of the carding room of Acushnet mill (New Bedford) No. 2 for the past six years, has resigned.

—Supt. G. T. Kennett, of the Millfort Mill Co., Fort Mill, S. C., is to take charge of the Lincoln Cotton Mills, Lincolnton, N. C.

—Harry W. Kimball, who has been superintendent of the W. A. Slater mill, Slatersville, R. I., for the past ten months, has resigned. His place will be taken by C. Fred Farrar.

—N. S. Linden has charge of the weaving at the Mooresville Cotton Mills, Mooresville, N. C.

—Fred Masher has taken a position as superintendent at the Richland Cotton Mills, Columbia, S. C. He was formerly superintendent at the Peoples' Cotton Mills, Montgomery, Ala.

—A. E. McDonald has become general manager of the Dixie Cotton Mills, La Grange, Ga., taking the place of Sam. C. Hale, manager, and W. E. Robinson, superintendent.

—Thomas Mahony, one of the second hands in the weave room of the Methuen Co.'s mill, Methuen, Mass., has been presented with a gold watch, chain and charm by the weavers.

—Henry C. Phillips has resigned as superintendent at the North Village mill of H. N. Slater, Webster, Mass., and taken a position at New York Mills, N. Y.

—Joel B. Ricker has retired as superintendent of the Springvale Cotton Mills, where he has been for 16 years. He is succeeded by Henry J. Holbrook, of New York, a nephew of the principal owner, E. W. Holbrook. Mr. Ricker was presented with a gold watch by the directors of the mills, and a gold watch chain by the employees of the weave room.

—C. B. Suttle, who has been overseer of spinning at the Lincoln Mills, is now with the Victor Cotton Mill, Charlotte, N. C.

—George Sinclair has taken position as overseer of carding with the Cherokee Falls Cotton Mills, Blacksburg, S. C. He was formerly overseer of carding and spinning in the cotton mills at Reidsville, N. C.

—John Watson has taken position as slasher tender at the Boott Cotton Mills, Lowell, Mass., having resigned his position with B. B. & R. Knight, at Pontiac, R. I.

—Henry Wiley, Fitchburg, Mass., has taken the position made vacant by A. G. Dockett as overseer of spinning at the Manville mill, Manville, R. I.

—Supt. Woods, of the Alpha Cotton Mills, Charlotte, N. C., has resigned.

—Patrick Woods, second carder in the Bernon mills at Georgiaville, R. I., was temporarily acting as overseer of that department during the past month.

—At the annual meeting of the Atlantic Cotton Mills of Lawrence, Mass., held in Boston recently, the resignation of Treasurer John W. Farwell was accepted, and Mr. Linzee Prescott was chosen in his place. Mr. Farwell has been the treasurer of the Atlantic Mills for the past ten years. He is also at the head of the Farwell Mills. Mr. Prescott is identified with the Johnson Mfg. Co., of North Adams, in the manufacture of fine goods.

—It is reported that James McAlister, of Worth Mfg. Co. Mill No. 1, has tendered his resignation as book-keeper to accept the position as secretary and treasurer of the Spray Cotton Mill, N. C.

Woolen.

—John Allen, who has been at Baltic, Conn., has taken a position as dresser in the Gilbert Mfg. Co.'s mill, Gilbertville, Mass.

—W. A. Allen, master mechanic at the Goodall Worsted Co.'s mill, Sanford, Me., was presented with a seal ring at Christmas by the employees.

—W. Appleton, formerly of West Conshohocken, Pa., has taken a position as overseer of finishing with the Hudson River Woolen Mills, Newburgh, N. Y.

—Jacob Bence will be overseer of weaving at C. D. & C. S. Chase's new mill at East Killingly, Conn. This is the old Hines mill.

—George Bailey, who has been at Middleboro, Mass., has taken a position as weaver and designer with Beebe, Webber & Co., Holyoke, Mass.

—C. Moses Barber, overseer of the carding department of the Campbell Mills, Potter Hill, R. I., on the occasion of his 47th birthday, Dec. 15th, was presented with a pair of fur driving gloves by the employees in his department.

—James Brown, Jr. has resigned his position as dresser tender in the George H. Gilbert Mfg. Co.'s mills at Gilbertville, Mass., and will accept a similar one with the American Mills, Rockville, Conn.

—C. H. Chrisholm is now boss dresser for the George H. Gilbert Mfg. Co., Ware, Mass.

—John Clapper overseer of wool carding in S. Sanfords & Son's at Amsterdam, N. Y., has resigned.

—Patrick Coughlin of Moosup, Ct. will take charge of the scouring and carbonizing plant of Alfred Dolge & Son, Dolgeville, N. Y.

—Joseph Dabieu has taken a position with the Cranston Worsted Mills, Bristol, R. I., as overseer of dyeing.

—Albert Durand has resigned his position as overseer of finishing with the Jefferson Mfg. Co., Jefferson, Mass., his place being taken by Peter Bossy.

—J. Lewis Eadie, head designer at the Jesse Eddy woolen mills at Fall River, Mass., has been elected superintendent at the Dingley Woolen Mfg. Co.'s plant, Philadelphia, Pa.

—Joseph Farrar has resigned as dyer for the Albany Mills, Albany, Ore., and taken a position with the Pendleton Woolen Mills, Pendleton, Ore.

—L. F. Forester, who has been foreman of the F. Gray Woolen Mills at Piqua, O., has resigned his position for a better one in Massachusetts.

—H. B. Frazer has take a position with the Summit Woolen Co., Staffordville, Ct. as overseer of finishing. He was formerly at Jefferson, Mass.

—James H. Frederichs overseer in the River Spinning Company, Woonsocket, R. I., returned Friday from a five weeks' trip abroad.

—George French of Franklin Falls, N. Y., has been made assistant superintendent of the Franklin mills.

—Henry M. Green, one of the best known citizens of Amsterdam, N. Y., died Jan. 7th. Mr. Green had been in the shoddy business in Rockton, under the firm name of Deaf & Green, for over 25 years. He retired from that business about 14 years ago, and became a liveryman.

—F. W. Hicks has resigned his position as overseer of carding at Kimball's mill, Manton, R. I. He has taken a position as overseer mule spinning at Bondsville, Mass.

—James Howard has resigned as

weaver at the Hockanum Mills, Rockville, Ct.

—Walter Jones, who has been boss dyer at the Hockanum Mills for a number of years, has resigned his position, Mr. Mowry of Woonsocket, R. I. taking his place.

—Daniel Kearney has accepted a position as loom fixer at the Farwell Worsted Mills, Central Falls, R. I.

—John C. Lyford, for a long time overseer in the mills at Pittsfield, Mass. died at the Odd Fellow's Home, Concord, N. H., recently.

—John Maguire, overseer of finishing at the Summit Mill, Staffordville, Ct., has resigned his position, and will go into business with his son, Clarence C. Maguire, Chepachet, R. I., they will operate the White mill, on a line of fancy worsteds.

—Nelson H. Mowry formerly boss dyer at the Privilege Mill, Woonsocket, R. I. and laterly with the Hinsdale, Mass. Woolen Mills, has accepted the position as overseer of dyeing with the Hockanum Company, Rockville, Conn.

—John W. O'Brien has accepted a situation in Sayles & Jencks mill as loom fixer at Warren, Mass.

—Martin O'Toole, second hand in the finishing room at the Potter Hill mill, Potter Hill, R. I., has accepted a position of overseer of finishing in a mill at Staffordville, Conn.

—Wm. H. Rider has resigned his position as overseer weaving at the Riverside mill, Olneyville, R. I., and will accept a similar position at the new Earncliffe. He is succeeded at the Riverside mill by Capt. John Kelley.

—James Roberts of Middleboro, Mass., is the new overseer of finishing at the New England mill, Rockville, Ct.

—John N. Rollinson has taken charge of the dressing and spooling at Joseph Dew's mill at Washington, R. I. He was formerly with the Carolina Mills Co. six years.

—A. H. Ryan formerly superintendent of the Berkeley Mill, Wales, Mass., and recently superintendent of the East Lake Woolen Mill, Bridgeton, N. J. has resigned.

—John Saltonstall will take charge of the shoddy mill at Shannock, R. I.

A. Shaw, superintendent for the Campbell Mills Co., Potter Hill, R. I., will take the agency of the mill in place of D. Taylor, resigned.

—James Shea, formerly boss spinner at Campbell, Henault & Co.'s mills at Westerly, R. I. has accepted a position in Collins' mill at Collinsville, Mass.

—John Tobin has resigned as weaver at the Dell Mill, Wales, Mass., and gone to Glastonbury, Ct.

—Sheckania Walker, overseer of finishing in the Calumet mill, was recently presented with a handsome stone ring from his employees.

Knit.

—Selby Archibold, of Cohoes, N. Y., for many years boss finisher of the Parsons mill has resigned and John Swartz will succeed him.

—J. B. Heslin has resigned as overseer carding in the American hosiery mill, Cohoes, N. Y., and will take a similar position in the Wynantskill mills, Troy, N. Y.

—Roy McCreedy, shipper at the Star Knitting Mill, Cohoes, N. Y., was presented with a silk umbrella by the employees in that department.

—J. F. Norton, who has been overseer knitting and looping at the Sulloway Mills, Franklin, N. H., has gone to Des Moines, Iowa. He is succeeded by Otis M. Davis.

—Michael Organ, who has been superintendent of the Waterford Knitting Mill, Waterford, N. Y., has taken the superintendency of the Wynantskill Knitting Mills, Troy, N. Y.

—D. M. Rankin recently superintendent of the Star Knitting Mill, Troy, N. Y. has been appointed superintendent of the New Britian knitting factory at New Britian, Conn.

—Thomas S. Ritchie, of Amsterdam, N. Y., has taken a position as overseer of carding at J. C. & J. C. Miller's mill, Baldwinsville, N. Y.

—Daniel Scullen has succeeded Michael Organ as superintendent of the Waterford Knitting Co.'s mill at Waterford, N. Y.

—Miss Nellie Sitcer, a forewoman in the Star knitting mill, received a handsome rocker Christmas from the employees in her department.

—De Lisle Stewart, overseer in the novelty department at the Victor knitting mills, was presented with a clock by the employees.

Miscellaneous.

—Peter Carr of Taunton, Mass. has taken the place made vacant by James S. Bourne, who has resigned as superintendent of the Bourne Bleachery, East Greenwich, R. I.

—Walter J. Green, who has been one of the pantographers at the Windsor Print Works for the past 15 years, has taken a similar position with the Arnold Print Works, N. Adams, Mass. Before leaving, he was presented with a silk unbrella by his shopmates.

—George Sanderson, who has been assistant designer at the Arnold Print Works, has removed to Taunton, and accepted a position there.

Marriages.

—Mr. Horatio Hathaway, son of the New Bedford manufacturer, and Miss Mabel Lovering, daughter of Agent Lovering of the Whittinton Mfg. Co., Taunton, were married January 15th.

Deaths.

—Henry F. Breitenstein, died at his home in West Utica, Jan. 7th, after an illness of two weeks, aged 24 years. He held the position as designer with the Globe Woolen Co. at the time of his death.

—Michael Callaghan, the oldest resident of Tarrytown, N. Y., died at Eastview, N. Y., Dec. 22nd, age 103. He was one of the best known carpet weavers in New York State, and worked until about ten years ago.

Alizarine Black

(PATENTED)

Distinguished from all other blacks by the acid test . . .

It is an acknowledged fact that woolen goods for men's wear of American manufacture, due to the more general use of Alizarine Dyes (including the Alizarine Black), are faster in color and therefore give better service to the public than the foreign goods. This is of special importance in view of the fact that our climate with the clear skies and bright sunshine is more trying to colors than in England, Germany or France

Wm. Pickhardt & Kuttroff

NEW YORK

—William Davis, a well known citizen of Dover, N. H. died at his home in that place Jan. 6th. He was for many years an overseer in the Cocheco Mills, but of late years has been engaged in farming.

—H. B. Hanson, superintendent of the Broad Brook woolen mill, Broad Brook, Ct., died at his residence on Jan. 11th, of heart disease.

—Charles A. Heath, who has been a prosperous silk manufacturer of Paterson, N. J., died at his home on Jan. 4th, aged 39 years. Mr. Heath was born in England, and engaged in the silk business there with an elder brother. He came to this country eight years ago, and went into the raw silk business, trading with large foreign silk houses, especially those in France and Italy. Two years ago his health gave way, and he was obliged to retire from business.

—W. C. Jillson, a retired manufacturer died at his home in Willimantic, Ct., Jan. 3rd, aged 64. During his active career he was agent and treasurer of three cotton mills, the Willimantic Duck Co., the Eagle Warp Co., and the Dunham Mfg. Co. He was a member of the Legislature in 1879.

—Robert B. Judge, the only surviving member of the ingrain carpet manufacturing firm of Wm. Judge & Bros., Columbia Ave., Philadelphia, died of apoplexy Jan. 8th, at his residence in Kensington, aged 58. Mr. Judge came to this country when 16 years of age, obtaining employment at the carpet factory operated by his two older brothers. At the age of 21 he was admitted to the firm. The plant has been enlarged several times, and at present 275 hands are employed there.

—Sylvester G. Keith, who has been employed by the Whitin Machine Co., Whitinsville, Mass., for over 50 years, died at his home at that place Dec. 19th, age 85.

—Charles F. Kendall, one of the most prominent knit goods manufacturers of the country, dropped dead from heart disease while at supper at the Burnett House, Cincinnati, Jan. 9th, aged 42 years. Mr. Kendall was president of the Kendall Knitting Co., vice-president of the Camden Woolen Mills, and director of several other corporations.

—John B. Lawton, who had been overseer of weaving in several cotton mills in Conn. and R. I., died January 11th, aged 80 years.

—Charles McMillan, who has been overseer of dyeing in the mill at Blackinton, Mass. for several years, died recently.

Joseph A. Mayo, who has been second hand at the mills of the Appleton Co., Lowell, Mass., died Dec. 23rd at the Lowell Hospital, age 37.

—Col. R. M. Oates, who was president of the Charlotte Cotton Mills, and also president of the National Bank of Charlotte, died recently after an illness of several weeks.

BUYERS' INDEX

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Architects and Mill Engineers.
Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Automatic Boiler Feeds.
D'Este & Seeley Co, 29 Haverhill St, Boston.

Automatic Feeds for Cotton and Wool.
Atlas Mfg. Co, Newark, N. J.
Harwood, Geo. S. & Son, 53 State St, Boston.
Kitson Machine Co, Lowell, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Bailing Machine.
Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.

Bandings.
See under Yarns.

Belting.
Alexander Bros., 410 No. 3d St., Phila., Pa.
Boston Belting Co., 256 Devonshire St., Boston, Mass.
Danforth Belting Co, 221 Chestnut St, Phila, Pa.
Fell, Geo. & Son Bolton, England.
New Jersey Car Spring & Rubber Co, Jersey City, N. J.
Ulmer Leather Co, Norwich, Conn.
See also Mill Supplies.

Belt Dressing.
Alexander Bros, 410 No. 3d St, Phila, Pa.
Danforth Belting Co, 221 Chestnut St, Philadelphia, Pa.

Bindings.
See Tapes and Braids.

Bleaching Materials.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Bobbins, Spools, Shuttles, Etc.
Woonsocket Shuttle Co, Woonsocket, R. I.

Boiler Compounds.
Imperial Chemical Co, 324 St. John St, Phila, Pa.

Boxes, Paper.
Palmer, J. S, 35 Wistar St, Germantown, Pa.

Boxes, Cloth Boards, Etc.
Pearson, J. T, Kensington, Pa.

Braids.
See Tapes, Braids and Edgings.

Burr Pickers.
Atlas Mfg. Co., Newark, N. J.
Curtis & Marble Machine Co., Worcester, Mass.
Sargent's, C. G., Sons, Graniteville, Mass.

Card Clothing.
Ashworth, Elijah, Fall River, Mass.
Farnsworth Card Clothing Co., Pittsfield, Mass.
Leigh, Evan A, 35 Mason Building, Boston.

Calico Printers' Machinery and Supplies.
New Bedford Copper Co, New Bedford, Mass.
Phillips Co, The Thomas, Providence, R. I.
See also Dyeing, Bleaching Machinery, etc.

Carders' Tools.
Brown, W. H, Mechanic St, Worcester, Mass.

Carpet Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Chemicals and Apparatus.
Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Chemist.
Adriance, John S., 105 East 39th St., New York.

Cloth Testing Machine.
McKnight, S, 771 Broadway, New York.

Combs (Wool and Cotton).
Crabb, William, & Co, Newark, N. J.
Townsend, Thomas, 157 Orange St., Providence, R. I.

Commission Merchants.
Hayes, O. H, & Co, New York.

Copper Print Rollers.
New Bedford Copper Co, New Bedford, Mass.
Phillips Co, The Thomas, Providence, R. I.
Revere Copper Co, 174 Oliver St, Boston.

Copper Work for Dyers.
Phillips Co, The Thomas, Providence, R. I.

Cotton (Egyptian).
Stoddard, Haserick, Richards & Co., Boston.

Cotton Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Ashworth, Elijah, Fall River, Mass.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Kitson Machine Co, Lowell, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Payne, Geo. W, & Co, Pawtucket, R. I
Phillips Co, The Thomas, Providence, R. I.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Townsend, Thomas, 157 Orange St., Providence, R. I.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Cotton Openers and Lappers.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kitson Machine Co, Lowell, Mass.

Cutters for Knit Fabrics.
Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.

Damper Regulators.
D'Este & Seeley Co. (Curtis), 29 Haverhil St, Boston, Mass.

Designers.
Fresnel, Gustave, 125 W. 56th St, N. Y.
Hand, F, & Co, Paterson, N. J.

Dryers.
Philadelphia Textile Machinery Co, Philadelphia, Pa
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.
See Wool and Waste Dusters.

Dyeing, Bleaching and Finishing.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Kensington Dye Works, Kensington, Pa.
Littlewood, G. J., & Sons, Manayunk, Pa.
Warren, W, Thread Works, Westfield, Mass.
Webster Dye Works, Webster, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.
Butterworth, H. W, & Sons Co, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Hopkins, A, & Co, Bridgeton, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Lincoln & Co, 54 Arch St, Hartford, Ct.
Parks & Woolson Machine Co, Springfield, Vt.
Phenix Iron Foundry, Providence, R. I.
Phillips, The Thomas Co, 91-95 South Main St, Providence, R. I.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Woonsocket Machine & Press Co, Woonsocket, R. I.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Dye Sticks.
Haedrich, E. M, 311 1-2 Walnut St, Phila, Pa.

Dyestuffs and Chemicals.
Anchor Color Mfg. Co, 464 Cherry St, New York.
Ashley, T. C, & Co, 145 Milk St, Boston.
Atteaux, F. E, & Co, 174 Purchase St, Boston, Mass.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Cochrane Chemical Co., 50 Kilby St., Boston.
Corey, S. J, 273 Congress St, Boston.
Dillon & Co, 20 Cedar St., New York.
Farbenfabriken of Elberfeld Co, 77 William St, N. Y.
Geisenheimer & Co, 189 Front St, New York.
Hanna-Schoellkopf Co, Philadelphia, Pa.
Holliday, Read, & Sons, 100 William St., New York.
Innis & Co, 120 William St, New York.
Jaeck Bros, J, 62-68 No. 11th St, Brooklyn, N. Y.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y.
Johnson, Wm. G, & Co, Uncasville, Conn.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 79 Murray St., N. Y.
Matheson, W. J, & Co, 178 Front St, N. Y.
Merrimac Chemical Co, Boston, Mass.
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oakes Mfg. Co, 93 Pearl St, N. Y.
Phillips (Moro) Chemical Co, 131 S. 3d St, Phila., Pa.
Pickhardt & Kuttroff, New York.
Roessler & Hasslacher Chemical Co, 100 William St., New York.
Sharpless Dye Wood Ext. Co, 22 N. Front St, Phila, Pa.
Stamford Mfg. Co, 133-137 Front St., N. Y.
Stone & Ware Co, The, 157 Maiden Lane, N. Y.
Sykes & Street, 85 Water St, N. Y.
Thomas, N. Spencer, Elmira, New York.
Webster Dye Works, Webster, Mass.

Dyers and Finishers.
Boston Finishing Works, Williamstown Mass.
Brophy's Sons, T, Jasper St., above Clearfield St., Philadelphia.
Cranston Worsted Mills (yarns), Bristol R. I.
Firth & Foster Co, Kensington, Pa.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket, R. I.
Industrial Dyeing & Finishing Works, 3829-45 Frankford Ave, Philadelphia.
Oakdale Dye Works, 913 W. York St, Phila, Pa.
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Warren, W, Thread Works, Westfield, Mass.
Webster Dye Works, Webster, Mass.

Dyers' Clogs.
Wildman, Jos, & Co, 1908 N. Front St, Phila.

Edgings.
See Tapes, Braids and Edgings.

Electricity.
Beacon Lamp Co, New Brunswick, N. J.

Electrotyping and Printing.
Whitcomb, H. C, & Co, Boston.

Elevators.
Cohoes Foundry & Machine Co, Cohoes, N.Y.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Salem Foundry & Machine Shop, Salem, Mass.

Embroidery, Hosiery Machine.
Ahlstrom, O J. 529 Broadway and 95 Spring St., New York.

Engineers, Mechanical.
Berlin Iron Bridge Co, E. Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Express Money Orders and Travelers' Cheques.
American Express Co. offices in every city

Fans—Exhaust and Ventilating.
See Ventilating Apparatus.

Feed Water Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Phœnix Iron Foundry, Providence, R. I.

Finishing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Fluted Rolls.
Cohoes Foundry & Machine Co, Cohoes, N.Y
Thurston, A. G, & Son, Box 528, Fall River. Mass.

Fulling Mills for Woolen Goods.
Hopkins, A, & Co. Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.

Gas Engines.
Jones, Lewis, 60½ and Media Sts, Phila, Pa.

Gas Singeing Machines.
Curtis & Marble Machine Co, Worcester, Ms.

Gear Cutting Machine.
Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E, Co, New London, Conn.

Harness Varnish.
D. L. Witmer & Bro, 5th St. and Germantown Ave, Philadelphia.

Heating.
See Ventilating.

Heddles.
Watson, L. S, Mfg. Co, Leicester, Mass.

Hosiery Boards.
Pearson, J. T, Kensington, Pa.

Hose and Rubber Goods.
Boston Belting Co., 256 Devonshire St., Boston.
New Jersey Car Spring & Rubber Co, Jersey City, N. J.

Index.
Burr Index Co, 336 Asylum St, Hartford, Conn.

Ink, Stamping.
Witmer, D. L, & Bro, 5th St. and Germantown Ave, Philadelphia.

Insurance (Employers' Liability).
Employers' Liability Assurance Co, 28 Central St, Boston, Mass.

Knit Goods Edgings, Trimmings, etc.
Byram, F. A, Germantown, Pa.
Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Fleming & Chapin, 229-231 Church St, Phila, Pa.

Friedberger & Co, Edgings, Germantown Phila, Pa.
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, 2632 Mascher St, Phila.
Weimar Bros, 1817 East York St, Phila. Pa.

Knit Goods Finishing Machines, Crochet, Etc.

Excelsior Sewing Machine Co, 120 N. 7th St, Phila, Pa.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 2097 E. Cumberland St, Phila, Pa.

Knit Goods Brushers.

Ardrey, S. B, & Sons, Bristol, Pa.
Jones, Lewis, Philadelphia, Pa.
Musgrove, C. M., Plainville, Conn.

Knitting Machine Cylinders.

Ashman, Stephen A, & Son, 3 Fetter Lane, Phila, Pa.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.

Knitting Machinery.

Boss Knitting Machine Works, 7th and Walnut Sts., Reading, Pa.
Branson Machine Co., 506 John St., Philadelphia.
Brinton, H, & Co, 213 Race St, Phila, Pa.
Campbell & Clute, Cohoes, N. Y.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Eckersley, Richard, N. E. cor. American and York Sts, Philadelphia, Pa.
Excelsior Knitting Machine Manufacturing Co., South Bethlehem, Pa.
Hepworth & Co, Lehigh Ave and Mascher St, Phila, Pa.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y.
Keystone Knitting Machine Mfg. Co, 40 No. 7th St, Philadelphia, Pa.
Leighton Machine Co, Manchester, N. H.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
McMichael & Wildman Mfg. Co, Norristown, Pa.
Mueller, A, 760 Lexington Ave, Brooklyn, N. Y.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 127 Bread St, Phila, Pa.
Payne, G. W. & Co, Pawtucket, R. I. (Winders.)
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 2097 E. Cumberland St., Phila., Pa.
Stafford & Holt, Little Falls, N. Y.
Standard Machine Co., 508 Minor St., Philadelphia, Pa.
Taylor, James, 835 Arch St, Phila, Pa.

Knitting Needles and Supplies.

Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co., Lakeport, N. H.
Ives, Loyal T, New Brunswick, N. J.
Keystone Knitting Machine Mfg. Co, 40 No. 7th St, Philadelphia, Pa.
Dodge Needle Co., Manchester, N. H.
Lydall, H, & Foulds, Manchester, Conn.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Musgrove, C. M., Plainville, Conn.
Page Needle Co, Chicopee Falls, Mass.
Sewing Machine Supplies Co, 72 Lincoln St, Boston, Mass.
Stoops, H. R, & Co, 66 No. 4th St, Phila, Pa.
Treat, Orlon, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Laboratory Outfits.

Bullock & Crenshaw, 528 Arch St. Phila, Pa.

Lamps, Electric.

Beacon Lamp Co, New Brunswick, N. J.
Lynn Incandescent Lamp Co., Lynn, Mass.

Looms.

Crompton & Knowles Loom Works, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts. Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St, Phila, Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Ms,
Woonsocket Machine & Press Co, Woonsocket, R. I.

Loom Picker Manufacturers.

Crompton & Knowles Loom Works, Worcester, Mass.
Loom Picker Co, Biddeford, Me.

Lubricators.

Dixon, Jos, Crucible Co, Jersey City, N. J.

Lumber.

Stearns, A. T, Lumber Co, Neponset, Mass.

Lumpers.

Gerry, George, & Son, Athol, Mass.

Machinery Dealers.

Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Schofield, Geo. L, 123 N. Front St, Phila,
Scott, James, 272 Chestnut St, Phila, Pa.

Machinery Wipers.

American Silk Mfg. Co, 311 Walnut St Philadelphia, Pa.

Machinists' Tools.

Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E. Co, New London, Conn.

Mails.

Walder, J, Paterson, N. J.

Measuring and Folding Machines.

Curtis & Marble Machine Co, Worcester, Ms
Elliott & Hall, 54½ Hermon St, Worcester, Mass.

Mill Builders and Engineers.

Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Mill Supplies.

American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bristol, The, Co., Waterbury, Conn
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Harwood, Geo. S, & Son, 53 State St, Boston.
Hill, Jas, Mfg. Co. Providence, R. I.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
New Jersey Car Spring & Rubber Co, Jersey City, N. J.
Spofford, Wm. S, & Son, 5-11 Culver St, Providence, R. I.
Stevenson Bros. & Co, 132 So. 2d St, Philadelphia, Pa.
Thurston, A. G, & Son. Fall River. Mass.
Watson, L. S, Mfg.Co, Leicester, Mass.

Napping Machines.

American Napping Machine Co, Williamstown, Mass
Ardrey, S. B, & Sons, Bristol, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.
Parks & Woolson Machine Co, Springfield Vt.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Oilless Bearings.

N. American Metalline Co, 62 W. Ave. and 3rd St, Long Island City, N. Y.

Oil Filters.

Burt Mfg. Co, Akron, Ohio.
Robertson, Jas. L, & Sons, 204 Fulton St, New York.

Paints.

American Fire Resisting Paint Co, 17 Broadway, New York.
Devoe & Reynolds, Fulton and Williams St, New York.

Pantagraphs for Mill Engraving.

Johnson, C. A, & Co, 22 Dey St, New York.

Patent Solicitors.
Crosby & Gregory, 34 School St, Boston, Mass.
Wright, Brown & Quinby, 53 State St, Boston, Mass.

Penstocks.
Dalrymple, George, Fair Haven, Vt.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.
Loom Picker Co., Biddeford, Me.

Picking, Carbonizing and Garnetting.
Garfield Woolen Co, Garfield, N. J.

Pipe Covering (Magnesia).
Keasby, R. A, 54 Warren St, New York.
Keasby & Mattison Co. Ambler, Pa.
Nightingale, S. C, & Childs, Atlantic Ave, Boston, Mass.

Pneumatic Conveying.
See Ventilating.

Power Transmitting Machinery.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Kilburn, Lincoln & Co, Fall River, Mass.

Presses.
Crawford. J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Phillips Co, The Thomas, Providence, R. I.
Pownall, F. H, Iron Works, Jamesburg, N. J.
Sullivan Machinery Co., Claremont, N. H.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Pressure Regulators for Steam and Water.
D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass.

Printers and Embossers.
Novelty Textile Printing Co, 447 449 W. 14th St, New York.

Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.

Reed and Harness Manufacturers.
American Supply Co, Providence, R. I.
Gowdey, J. A, & Co, Providence, R. I.
Loom Picker Co, Biddeford, Me.
Walder, J, Paterson, N. J.

Ribbons.
Cheney Bros, S. Manchester, Ct.

Roller Skins.
Fell, Geo, & Son, Bolton, England.

Roofing, Gravel, Slag and Composition.
Armitage Mfg. Co, Richmond, Va.
Warren Chemical & Mfg. Co, 45 Fulton St, New York.

Roofing, Paint and Paper.
Armitage Mfg. Co, Richmond, Va.

Roving Cans and Sheet Metal Work for Mills.
Hill, Jas, Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.
Sullivan Machinery Co, Claremont, N. H.

Saddles, Stirrups and Levers.
Dixon Lubricating Saddle Co, Bristol, R. I.

Sample Cutters.
Gleason, A. H, Rockbottom, Mass.

Schools.
Gavey Correspondence School of Textile Design. P. O. Box 222, Brooklyn, N. Y.
Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

Sewing Machines and Supplies.
Curtis & Marble Machine Co, Worcester, Mass.
Dinsmore Mfg. Co, Salem, Mass.
Frame, Gibbons, 2nd and Diamond Sts, Phila, Pa.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Stoops, H. R, & Co, 66 No. 4th St, Phila, Pa.

Shearing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.
Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.
See Wool Shoddies.

Shuttles.
See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.
Crompton & Knowles Loom Works, Worcester, Mass.

Singe Plates.
New Bedford Copper Co, New Bedford, Ms.

Sizing.
American Glutrose Works, Penn Mutual Bldg, Phila, Pa.

Slashers.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.
Phillips Co, The Thomas, Providence, R. I.

Soaps.
American Soap & Washolene Co, Cohoes, N. Y.
Holbrook Mfg. Co., 466 Washington St., N. Y.
India Alkali Works, Boston.

Spindles.
Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Ward & Vandegrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.
Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.
Hill, Jas. Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Spinning Frames.
See Cotton Machinery.

Spinning Rings.
Draper Company, Hopedale, Mass.
Whitinsville Spinning Ring Co, Whitinsville, Mass.

Spinners' Supplies.
Dixon Lubricating Saddle Co, Bristol, R. I.

Spinning Tubes.
Buckley, Benj's. Son, Gun Mill, Paterson, N. J.

Steam Boilers.
Brown, C. H, & Co, Fitchburg, Mass.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.
Mutual Boiler Insurance Co, 31 Milk St, Boston.

Steam Damper Regulators.
D'Este & Seeley Co, 29 Haverill St, Boston Mass.

Steam Engines.
Brown, C. H, & Co, Fitchburg, Mass.
Hooven (The), Owens & Reutschler Co, Hamilton, O.
Toomey, Frank, 131 N. 3d St, Phila, Pa.

Steam Separators.
D'Este & Seeley Co. (Curtis), 29 Haverill St., Boston.
Robertson, Jas. L, & Sons, 204 Fulton St, New York.

Steam Specialties.
D'Este & Seeley Co, 29 Haverhill St, Boston
Haines, W. S. C 136 South 4th St, Phila, Pa.
Robertson, Jas L, & Sons, 204 Fulton St, New York.

Steam Traps.
D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass. (return float and expansion).
Haines, W. S. C 136 South 4th St, Phila, Pa.

Tanks, Tubs and Vats.
Corcoran, A. J, 11 John St, New York.
Cypress Lumber Co, Apalachicola, Fla.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No. 9th St, Phila, Pa

Tapes, Braids and Edgings.
Fleming & Chapin, 229-231 Church St, Phila, Pa.
Friedberger & Co, Germantown, Pa.
Krout & Fite Mfg. Co., 2632-40 Mascher St., Philadelphia.
Perseverance Mills, 2632-40 Mascher St. Phila, Pa.
Weimar Bros, 1817 East York St, Phila, Pa.
Young, Wm. M, 3638-40 Frankford Ave, Philadelphia, Pa.

Teasels.
Kellogg, Wm, W, Skaneateles, N. Y.
McLaughlin Bros, Skaneateles Falls, N. Y.

Temperature Regulators.
D'Este & Seeley Co, 29 Haverhill St, Boston.
Haines, W. S. C, 136 South 4th St, Phila, Pa.

Tentering Machines.
See Dyeing, Bleaching Machinery, Etc.

Tension Pulleys.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Testing Machines.
Howard, Geo. C., 1783 Barker St., Phila., Pa

Traveler's Cheques.
American Express Company.

Turbines.
(See Water Wheels.)

Valves.
D'Este & Seeley Co, 29 Haverhill St, Boston Mass.

Ventilating Apparatus.
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Massachusetts Fan Company, Room 641, 53 State St, Boston.
New England Ventilating & Heating Co, Providence, R. I.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Washers (Cloth).
Hopkins, A, & Co. Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Phillips Co, The Thomas, Providence, R. I.

Watches.
Elgin, National Watch Co., Elgin, Ill.

Watchman's Clock.
Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Nanz & Co, 116A Chambers St, New York.

Water Pressure Regulators.
D'Este & Seeley Co, 29 Haverhill St, Boston.

Water Wheels.
Bradway, C. P, West Stafford, Conn.
Christiana Machine Co, Christiana, Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.
Bradway, C. P, W. Stafford, Ct
Cohoes Foundry & Machine Co, Cohoes N. Y.
Leffel, James & Co, Springfield Ohio.
Lombard Water Wheel Governor Co, 61 Hampshire St, Boston.

Winders. (Hosiery.)
Payne, G. W. & Co. Pawtucket, R. I.
Universal Winding Co, 226 Devonshire St, Boston.

Wood Pulleys.
Saginaw Manufacturing Co, Saginaw, Mich.

Wool.
Lyon, John H, & Co, 12 Reade St, N. Y.
Webb, Chas. J. & Co, 156 N. Front St. Phila Pa.

Wool Cleaning Compound.
India Alkali Works, Boston.

Wool Combing Machinery.
Crabb, Wm, & Co, Newark, N. J.
Crompton & Knowles Loom Works, Worcester, Mass.
Townsend, Thomas, 157 Orange St, Providence, R. I.

Wool Extracts.
Daly, Jas. E., Paterson, N. J.
Garfield Woolen Co, Garfield, N. J.
Sullivan, R. T, 180 Summer St, Boston, Mass.

Wool and Waste Dusters.
Gerry, Geo, & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass
Stillman-Randall Machine Co, Westerly, R. I.

Woolen and Worsted Machinery.
Altemus, W. W, & Co, 2816 N. 4th St, Phila Pa.
Atlas Mfg. Co., Newark, N. J.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 23d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Harwood, Geo. S, & Son, 53 State St, Boston.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Kitson Machine Co, Lowell, Mass.
Parks & Woolsen Machine Co., Springfield, Vt.
Payne, G. W. & Co, Pawtucket, R. I.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Phillips Co The Thomas, Providence, R. I.
Sargent's, C. G., Sons, Graniteville, Mass
Stoddard, Haserick, Richards & Co, Boston, Mass.
Woonsocket Machine & Press Co Woonsocket, R. I.
Woonsocket Napping Machine Co., Woonsocket, R. I.

Wool, Hair and Noils.
Fowles & Co, 106 Church St, Phila.
Webb, Chas. J., & Co , 142-156 N. Front St., Phila., Pa.

Wool Shoddies.
Bowers', James, Sons, Ltd, Chester, Pa
Daly, James E, Paterson, N. J.
Garfield Woolen Co, Garfield, N. J.
Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.
Riverdale Woolen Co, Riverdale, Northbridge, Mass.

Wool Sorters and Scourers.
Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.

Wool Washing, Preparing and Drying Machinery.
Kitson Machine Co, Lowell, Mass.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G, Sons, Graniteville, Mass.

Yarns, Threads, Etc.

Banding.

Moore, C. & Co. 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Westfield, Mass.
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
White, James F, & Co, N. Y. and Phila, Pa.
Whittier Cotton Mills, Lowell, Mass.

Carpet Yarns.

Fleming & Chapin, 229-231 Church St, Phila, Pa.

Cotton Yarns.

American Spinners' Cotton Yarn Exchange, 226 Devonshire St, Boston.
Catlin & Co, New York and Boston.

Dana Warp Mill, Westbrook, Me.
Eddy & Street, Providence, R. I.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Indian Orchard Co., Indian Orchard, Mass.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
New England Thread Co, Pawtucket, R. I.
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.
Tucker & Cook Mfg. Co, Conway, Mass.

Cotton Warps and Yarns.

American Spinners' Cotton Yarn Exchange, 226 Devonshire St, Boston.
Clark, Wm, Co, Westerly, R. I.
Cohannet Mills, Taunton, Mass.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Fleming & Chapin, 229-231 Church St, Phila, Pa
Germantown Spinning Co, Germantown. Pa.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Hawes, O. S, & Bro, Fall River, Mass.
Holland & Webb, 478 Broadway, N. Y.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
Kerr Thread Co, Fall River, Mass.
King, Alex, & Co, 54 Leonard St, New York City.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
Monument Mills, Housatonic, Mass.
Orswell Mills, Fitchburg, Mass
Montgomery, J R, Co, Windsor Locks, Ct.
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co., 86-88 Franklin St.
White, James F, & Co, 54 56 Worth St, N. Y.
Whittier Cotton Mills, Lowell, Mass.

Gassed Yarns.

Greene & Daniels Mfg. Co, Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York.

Glazed Yarns.

Blodgett & Orswell, Pawtucket, R. I.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Fleming & Chapin, 229-231 Church St, Phila, Pa.
Indian Orchard Co., Indian Orchard, Mass.
Kerr Thread Co, Fall River, Mass, and 29 Mercer St, N. Y.
King, Alex, & Co, 54 Leonard St, New York.
Malcolm Mills Co, Frankford, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Harness Twines.

Fawcett, Hughes, 115 Franklin St., N. Y.
Hadley Co, 95 Milk St, Boston, Mass.
Kerr Thread Co, Fall River, Mass, and 29 Mercer St, N. Y.
King, Alex. & Co, 54 Leonard St, New York.
Moore, C., & Co., (S. W. cor. 5th and Market Sts.)
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Hosiery and Knitting Yarns.

American Spinners' Cotton Yarn Exchange, 226 Devonshire St, Boston.
Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo, & Co, Phila, Pa.
Clark, Wm. Co, Westerly, R. I.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Clear River Mills, Pascoag, R. I.
Cohannet Mills, Taunton, Mass.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Fleming & Chapin, 229-231 Church St, Phila, Pa.
Germantown Spinning Co, Germantown, Pa.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Holland & Webb, 478 Broadway, N. Y.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Kerr Thread Co, Fall River, Mass.
King, Alex, & Co, 54 Leonard St, New York.
Mitchell, James E, & Co, Phila. and Boston.
Monument Mills, Housatonic, Mass.
New England Thread Co, Pawtucket, R. I.
Orswell Mills, Fitchburg, Mass.
Porter Bros, 78 Worth St, New York.
Rockwell, E. M, Leominster, Mass
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co, 86-88 Franklin St, N. Y.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co, N. Y.
Warren, W, Thread Works, Westfield, Mass.
White, James F, & Co, 54-56 Worth St, N. Y.
Whittier Cotton Mills, Lowell, Mass.

Flax, Hemp, Jute and Ramie.

Eichman & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Fawcett, Hughes, 115 Franklin St., N. Y.
Holland & Webb, N. Y.

Mohair Yarns.

Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Holland & Webb, New York.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Cranston Worsted Mills, Bristol, R. I
Eichmann & Sternberg, New York City.
Holland & Webb, New York.
Indian Orchard Co., Indian Orchard, Mass.
Malcolm Mills Co, 229 Chestnut St, Phila, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eddy & Street, Providence, R. I.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Fleming & Chapin, 229-231 Church St, Phila, Pa.
Hawes, O. S. & Bro, Fall River, Mass.
Holland & Webb, 478 Broadway, N. Y.
Ryle, Wm, & Co, 54 Howard St, N. Y.

Woolen and Merino Yarns.

Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Clear River Mills, Pascoag, R. I.
Eddy & Street, Providence, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Porter Bros, 78 Worth St, New York.
Rockwell, Edward M, Leominster, Mass.
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Worsted Yarns.

Alleghany Worsted Mills, Phila, Pa.
Botany Worsted Mills, Passaic, N. J.
Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo, & Co, Phila, Pa.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson Ave., Camden, N. J.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Herbst & Jones, 21st and Naudain Sts, Philadelphia, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Phoenix Mills Co, 13 Letitia St, Phila, Pa.
Porter Bros, 78 Worth St, New York.
Sawyer, Manning & Co., 86-88 Franklin St, N. Y.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

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JAMES L. ROBERTSON & SONS.

204 Courtlandt St., N. Y. 12 Pearl St., Boston

SITUATIONS WANTED.

The advertisers in the following columns should be addressed in care of TEXTILE WORLD, or inquiries concerning them may be addressed directly to "Information Department, TEXTILE WORLD," as full particulars of each advertiser are on file, and the addresses of suitable agents, superintendents and foremen for every branch of the textile industry will be furnished to manufacturers.

Any subscriber may file his application, and no charge is made until position is secured.

The business of this department is held strictly confidential.

The applications of good overseers in every department, who are in want of positions, are solicited.

Manufacturers are invited to use this department when in need of skilled men; each case will be handled confidentially, with promptness and judgment, and without charge to manufacturers.

A member of the firm is in charge of this department, and gives personal attention to each case.

WOOLEN SUPERINTENDENTS.

1349 **Woolen Supt. or designer.** Has been 12 years superintendent of 20 set mill in Conn., until recently, when he resigned on account of children's schooling. Has also been designer and pattern weaver. High character and first-class ability. Age 39; American, married. Experience on worsteds, cassimeres, cheviots, ladies' fancy dress goods, etc.

1170 **Woolen Superintendent** wants a position as superintendent and designer of a small mill, or superintendent of a large mill. Age 54; marrried. Don't want a position in any of the Southern or Western states. Has worked on a great variety of goods, and can refer to reliable parties.

1258 **Woolen** Superintendent, Carder, Spinner or Weaver. Has experience in dyeing. Is a reliable man. 40 years old. Refers to responsible parties as to character and ability.

1203 **Superintendent, Woolen,** or superintendent and designer. Age 39; married. Has held a position as superintendent 9 years; 2 years in one mill and 7 in another. Has good references. A good man on meltons, overts, cassimeres, worsted and kerseys; also serges.

1268 **Woolen** superintendent or designer. First-class experience in England and America. A first-class man in every way; age 34; married. Fancy worsteds, cheviots, novelty goods, cassimeres, overcoatings, cloakings, dress goods, piece dyes, worsteds and cheviots.

1305 **Superintendent and Designer** with 20 years' experience in woolen mills, on cassimeres, cheviots, worsteds and cloakings. Is now out of employment. Wants position at once.

1290 **Manufacturer from Scotland** wishes situation as superintendent; thoroughly practical in Scotch tweeds, cheviots, Saxonies, plaids, etc., from wools to finished cloth. Will start with small salary.

1255 **Felts.** The advertiser has a thorough, practical knowledge of all the details connected with the manufacture of paper makers' felts and jackets; especially adapted for fast running machines; good reason why he is now in the market; recommended by past employers.

1250 **Superintendent,** or would accept a position as designer in a good woolen mill. Understands fancy cassimeres, cloakings, dress goods, kerseys, unions and worsteds. Can produce the Jacquard effect on an ordinary cotton, Knowles loom. Refers to good mills.

1239 **A man who understands the** manufacturing of woolens in all the details, is open for an offer. Is an experienced manager, and is at present in charge of a mill that is being run at a profit.

1227 **A Superintendent** with a thorough practical training in all the departments of a woolen mill making worsted cassimeres, dress goods, cloakings, overcoatings, robes, blankets, shawls, etc. Has a thorough knowledge of designing and has held position in first class mill, to which he can refer.

1231 **Manufacturer.** One who has had a thorough experience in the management of a mill of his own, and who can show proof as to his ability, is now in the market for a position as superintendent or assistant superintendent with any good company. Age 40; married.

COTTON SUPERINTENDENTS.

1337 **Assistant Superintendent.** Expert on book binder's cloth, window shades, fan cloths, friction callender machines. 20 years with Wilson & Bentleys, London, and about 2 years employed in this country. Age 45, married. American and English references.

1332 **Supt. with long experience** in both Northern and Southern mills. Has started 3 Southern mills, on print cloths, broad and narrow sheetings and fine shirtings. First class references from all past positions. Age 48. Might accept position as overseer of large weave room.

1265 **Superintendent** wants position as superintendent of cotton cloth mill. Has had charge of each department in the mill; aged 38 years; married.

1266 **Cotton** superintendent wants position. Out on account of mill shutting down. Understands fancy and plain cottons, white and colored. Has a first-class record.

1267 **Cotton** superintendent or carder. Prints, sheetings, ginghams, fine and coarse, white and colored. Nearly all kinds of machinery. References all right. Age 47; married.

1269 **Cotton** superintendent, carder, spinner and dresser; 43; married. Has held position in some of the best mills; is strictly temperate, and well recommended. Cotton, flannels, ginghams, crochet and Marseilles quilts, etc.

1306 Young American wants position as cotton superintendent. Experience mostly on cotton warps. Has been bookkeeper, overseer of carding and spinning; also superintendent in Massachusetts mills.

WOOLEN CARDERS.

1249 **Carder and Spinner,** woolen, wants position. Familiar with a great variety of goods. 37 and married.

1248 **Carder,** woolen. Age 37 years; married. 16 years with one of the best mills in New England. Dress goods, beavers, blankets, cotton warp hair lines and kerseys.

1307 **Carder** with unusually fine record and very wide experience desires good position in New England, Central or Western States. First-class references from past positions. Age 44. Experience on cassimeres, cheviots, dress goods, broad-cloth, repellants and blankets.

1309 **Woolen Carder.** 21 years' experience in charge at first-class mills. Has worked on fancy cassimeres, cheviots, meltons and kerseys. Age 45; married. At present out of work.

1230 **Superintendent or Carder and** spinner wants position in woolen mill. Age 30; married. Can take position at once. Familiar with jeans, cassimeres, flannels, knit goods and shoddies.

1347 **Woolen Carder.** Seventeen years' experience. Cassimere and hosiery yarns. Age 39, married; well recommended. Mill where last employed shut down.

1321 **Boss Carder.** Over 30 years' experience in woolen mills. American. Will except second hand position in large mill. Well up on dress goods, broadcloths, flannels, kerseys, etc. Has best references.

1314 **Woolen Carder.** American. Age 30. Married. At present employed. Experience on beavers, cassimeres, cheviots, dress goods. Well spoken of by former employers. A first class man for a small mill.

COTTON CARDERS.

1339 **Cotton Carder,** young man holding first-class position in New York State, would like position in Eastern or Middle States as assistant superintendent or boss carder paying $5.00 or more a day. Is worth that salary; experience and references of the best.

1277 Young Frenchman, with wide experience and good references, wants position as boss carder. Age 38; married.

1138 Second hand of cotton carding wants position. Has had a good experience in that position. References.

1260 **Young Man** who has worked up through carding rooms of some of the best mills in New England, wants position as overseer in New England or Middle States. Age 27. Not married

1238 **Second** hand of cotton carding. 37; married. Open for engagement.

1315 **Cotton Carder.** Over 20 years' experience as overseer in first class mills. At present employed. Well up on prints and light and heavy sheetings. Knows American and English cards, and speeders. Best references.

1320 **Cotton Carder.** 12 years' experience as overseer in first class mills. Can refer to well known mill men. Age 39. Married.

WOOLEN SPINNERS.

1299 Woolen Spinner who has had experience as second-hand would like a position as boss spinner. Would accept small salary to start. Has worked on cloakings, dress goods and Scotch tweeds in New England mill.

1287 **Young Man** wants position as boss spinner. Experience in first-class mills on cassimeres, kerseys, cheviots, satinets; knows Davis & Furber, Paul and Johnson & Bassett machines. Age 29. Wife works in mill.

1195 **Spinner, Woolen.** American; age 31; married. Experienced on yarns from 1 to 7 1-2 run. Refers to past and present employers. Wants position as overseer. Will not go to Southern States, Canada or Connecticut. Is an experienced overseer.

1112 **Overseer of Woolen Spinning** wants position. Has first-class references. Age 37. Wages reasonable. Will accept second hand's position.

1276 **Spinner,** woolen. Wool and shoddy from 1-2 to 10 run, cassimeres, flannels, dress goods, underwear and blankets. Davis & Furber, Furbush & Sons, Johnson & Basset, and Schmidt machinery. Good references.

1204 **Situation wanted** as boss spinner, or second hand and mule fixer on Plain mules. Many years experience on yarns for dress goods in England, and also yarns for fine woolen cloth. 35 years old and married; good references.

1316 **Overseer Worsted Drawing** and spinning. Will accept first class position at $3 or more per day. At present employed in well known and first class mill. Age 42. Married. Best references from former employers.

COTTON SPINNERS.

1284 **Eleven years as Overseer** in first-class gingham mill, with other experience, has fitted this man for good position in charge of ring spinning, spooling and warping. Age 40. French American; married.

1223 **Wants position as Overseer of** Spinning or Twisting, or both. Familiar with fine or coarse numbers. Refers to past and present employers.

1272 **Second Hand** of cotton ring spinning wants position in Massachusetts, Rhode Island, Maine or New York. Age 23; married.

1280 **Wanted, situation** as overseer or second hand of mule spinning by a thorough, practical man. Good references from past and present employers. Understands all English makes of mules. Will go South or Canada.

1350 **First-Class Ring Spinning** overseer, also spooling, warping, slashing, web drawing; large experience, highest references as to skill, character and executive ability. At present employed in Fall River. Age 48, American.

1344 **Mule or] Frame Spinner,** is at present employed in first-class print cloth mill in New England, where he has been for 9 years. Can take charge of room. Age 28, married; good references from present place. Wants $3.00 or more.

WOOLEN WEAVERS.

1340 **Worsted Weaver** would like position in a small mill at moderate salary; experience as fixer and in cloth room. Age 38, married. Knowles and Crompton looms; references good.

1253 **Weaver, Designer or Superintendent** Open for a position. Refers to past and present employers. Aged 47; married. Worsted cloakings, cassimeres and dress goods.

1130 **Overseer of Woolen Weaving** wants position. Would accept 2nd hand's position in a good mill. American; protestant; age 36; single. Good man on Knowles fancy and plain looms, also Davis & Furber. Cassimeres, worsteds, meltons and flannels Will not go South, West or Pennsylvania.

1273 **Woolen** weaver wants position. Age 35; married. A first class man.

1313 **Woolen Weaver.** First class references, and experience on fancy cassimeres, kerseys, beavers, dress goods, etc. At present not employed, for good reasons. Age 44. Married.

COTTON WEAVERS.

1297 **Overseer of Weaving.** A man of the very best standing desires a permanent position in first-class mill. He has worked in several of the best mills in New England for upwards of twenty years, and can show splendid references. Has worked on sheetings, prints, sateens, fancies, lenos and plaids. Now unemployed.

1242 **Overseer Cotton Weaving.** Familiar with plain cloths, sateens, fancy checks and stripes, box looms and dobbies. References. Age 43; married. One weaver, one twister in family.

1334 **Jacquard and Dobby Weaver** and designer on Knowles machines. 8 years' experience in this position. At present employed and can furnish excellent references. Age 38; married.

1333 **Overseer of Cotton Weaving** with more than 20 years' experience in weave rooms of N. E. and Canadian mills. Experience on all kinds of white and colored, plain and fancy work, except Jacquard, American and English, looms. Married; age 37.

1288 **Overseer of Cotton or Worsted** weaving wants position. Familiar with all kinds of looms; plain or fancy work. Age 45; married.

1343 **Boss Weaver or Spooler** whose long experience as a manufacturer in England of all kinds of spread and fancies, and later in Canadian mills from sheetings to dress goods and Jacquard work, qualifies him for a first-class position; highest references. Can start immediately.

1247 **Elastic** weaver wants position as overseer. Used to cotton web, elastic suspenders, silk neckwear, dress goods and handkerchiefs. 28.

1261 **Weaver.** Cotton, woolen, ramie and silk goods. Good experience in first-class mills.

FINISHERS.

1351 **Woolen and Worsted Finisher** with 7 years' experience as overseer in R. I. and N. Y. mills, from which he has excellent references. At present second hand in one of the best worsted mills in N. E. Habits first-class; age 29, married.

642 **Knit Goods Finisher** at present out of employment because of change in superintendent. Englishman who learned his trade in Nottingham and has since been overseer 14 years in large Canadian and American mills. Married, age 46. First-class manager of help.

1322 **Woolen Finisher.** Over 15 years' experience in Canadian and American mills as finisher. Almost all kinds of woolen goods. At present employed but wants position paying $3 per day, or more. Age 35. Married. An unusually skillful finisher.

1041 **Woolen Finisher.** Has had experience on fancy and piece dyed goods, cassimeretes, cheviots, worsteds, kerseys and dress goods. Wants position as overseer or second hand in New England States. Age 26 years. Will work for $2.50 per day.

1330 **Expert Finisher** with 10 years' experience in European mills. Can do perfect work on highest grade cassimeres, serges, cheviots, kerseys, worsteds, astrachans. Age 34; married. German, speaks English imperfectly.

DYERS.

1302 **Young Dyer** wants position as second-hand or overseer in small mill. Has been under good men in well-known mills.

1303 **Dyer** with six years' training in Bradford, England, before coming to this country. Has been in several American and Canadian mills and given best satisfaction. A thoroughly practical and up-to-date dyer. Age 32. At present employed, and would accept only first-class position

1318 **Dyer** with large experience in Scotland, Canada and the States, fancy worsteds, meltons, ladies' dress goods, hosiery, raw cotton, wool or shoddy; Scotchman, age 42, married. A man of high character, skilful and energetic; references of the highest order.

1348 **First-Class Dyer**, with 10 years' experience, worsted, yarn, raw wool, piece goods, Indigo work and felts. Highly recommended by past employers. Age 33, married; for good reasons out of employment.

1145 **Cotton Dyer**, with many years' experience on chain warps, yarns and threads. Twenty years at last place, where mill has shut down; good habits and highly recommended. Age 50. married.

1327 **Skillful Dyer** with experience on raw cotton and wool, indigo blue vats, slubbing, worsted and woolen yarn, piece dyeing on ladies' dress goods and men's suitings. Age 45; married. First class references from good mills.

1319 **Boss Dyer.** Wool, cotton, or raw stock. Alizarine colors; shoddy, carpet yarns, straw goods, beavers. Blue-blacks, all kinds of fancy dyeing. Belgian. Age 29. A thorough master of his trade.

1323 **Dyer** of large experience on cotton chain and skein work. Age 40; married. At present employed, but wants higher wages. References from good mills.

KNITTERS.

1257 Superintendent of knitting mill wants position; is a finisher and understands every part of the business, including shipping all kinds of goods, fabrics, cotton, worsteds, silks, wool on all kinds of shapes, and flat goods; most all kinds of knitting machinery and finishing machinery; age 32; married; refers to past record.

1274 A man who thoroughly understands the manufacture of hosiery from the fleece to the case, and is a good manager. Desires to correspond with parties wishing to employ such a man.

1310 **Foreman** with large experience in circular rib knitting. Has worked on almost all kinds of machinery. Is at present out of work, because of mill going out of business. Age 25. Excellent references.

1317 **Knitting Overseer.** Wide experience. Age 36. Not married. Has worked on fleece lined underwear, eider downs, stockinet, jerseys, etc. Familiar with spring needle circular machines First class references.

1342 **Hosiery or Underwear Supt.** A practical knitter familiar with latch, spring needle, and sewing machines; nearly 15 years superintendent of New England hosiery mill, at present shut down. Good manager; references first-class. Age 47; married.

1338 **Boss Knitter** of sweaters, cardigans, etc., familiar with Lamb and and German machines; 6 years in charge of knitting for first-class manufacturers. Age 33, married. At present out because of mill shutting down.

DESIGNERS.

1275 **Designer** or assistant. Age 25; married. A good man on cotton or worsted fancy dress goods. Jacquard and box looms.

1263 **Assistant** Designer or Assistant Superintendent. Has received a practical mill experience, and is a graduate of the Philadelphia Textile School. Unions, cassimeres, suiting, cloakings. Age 24 years.

1252 **Designer, Weaver or Dresser.** Aged 40 years; married. Familiar with nearly all kinds of men's wear, piece dyes, etc. Refers to past and present employers.

Account Wanted. Gentleman regularly visiting the cloak, clothing and shirt trade in New York, desires to represent some good mill. Best references. Address P 156, care TEXTILE WORLD.

1326 **Graduate Phila. Textile School** wants position as assistant superintendent or designer in cotton mill. Has also had 3 years' practical experience in mill. Very highest references.

1329 **Accountant or Secretary** thoroughly competent to assume full charge of any set of private, partnership or corporation books. Would take small amount of stock in Southern cotton mill and act as secretary and accountant. Temperate, energetic, excellent references. Age 30; married.

9999 **Superintendent Print Works.** Young man, 30 years of age, energetic and practical, graduate chemist, with thorough experience in printing, especially of silk (2 years in Europe and 4 in this country), seeks position as superintendent or assistant in print works. Address Chemist, care TEXTILE WORLD.

MISCELLANEOUS.

1300 **Wool Sorter** with experience in first-class English mill. Thorough knowledge of wool, noils, waste and all kinds of garnetting. Has not been employed in this country, but can give American references as to character.

1301 **Book-keeper and Paymaster.** Young man of the very highest character desires to move away from the Atlantic coast, on account of his health. Best references from his present and former employers.

1283 **Laboratory Chemist** with experience in large mills and supply house desires position. A moderate salary.

1293 **Bookkeeper** with 22 years' experience in woolen and worsted mills; excellent references. Age 50. Wants permanent position with moderate salary.

1336 **Beaming and Slashing.** Experience in Mass. and Me. cotton mills on ginghams, dress goods and all kinds colored goods. Age 30; habits first-class, good references. At present employed in large mill.

1335 **Loom Fixer or Second Hand.** Knowles and Crompton looms, fancy worsteds and cassimeres, dress goods. German; Protestant; age 37, married. Has been employed in good mills and is very well recommended.

1345 **Master Mechanic.** In charge of one large plant for past 15 years, and previous to that 5 years in charge for one of the largest mills in New England. Capable of accomplishing best results at low cost; references from leading engineers and managers.

1346 **Chemist or Salesman.** Graduate Crefeld Textile School, colorist for German manufacturers, and since employed for 3 years in this country as colorist. Young man, single.

1341 **Dye-Stuff Salesman**, with experience in dye house for several years; many friends and relatives as dyers. Would start on small salary and expenses. Age 30, single. Might take second hand job in dye house.

1312 **Overseer Dresser.** Age 34. Married. Is at present working in a first class mill. Desires to change because of poor health of family. Can furnish first class references. Cassimeres, unions, woolens.

1153 **Comber.** Understands repairing and running combers, speeders and cards. Overseer seven years in one of England's fine mills, on counts ranging from 120s to 150s. Will accept a position as overseer or 2d hand. Refers to responsible parties as to ability and character.

1202 **Silk Superintendent** is open for an engagement with a first-class company. Has a thorough knowledge of all the details connected with the manufacturing of silk ribbons and hat bands, from throwing to the finished product. Has held the position of superintendent of a first-class mill for several years. Under 30 years of age, and married. Has the best of references. For any further information address this paper.

1229 **Dresser.** Overseer of woolen dressing. Age 30. Men's wear and dress goods. Good references.

1228 **Shearer.** Wants position as overseer of shearing. Good man on cassimeres, worsteds, unions and cheviots. Age 25; married. References.

TEXTILE BOOKS.

The following are recent publications, which we will furnish upon receipt of their price.

Wool Dyeing, by William Gardner. 8vo, 91 pages, fully illustrated.

This is an attempt to deal with wool dyeing in a scientific manner, explaining the theories which underlie the different operations. Prominence is given to the practical side, and working details of all important processes are attached. Among the subjects treated may be mentioned the following: Wool Scouring; Bleaching Wool; Character and Impurities of Water; Mordants; Assistants, and other Chemicals. Price $2.

The Student's Hand-Book of Practical Fabric Structure, by H. Neville. 8vo., 235 pages.

The object of this work is to interest the student in the subject of weaving by a series of consecutive lessons in the principles of fabric structure. Free use is made of sectional diagrams, to show what actually takes place in producing any particular fabric. An idea may be had of the nature of the book from the following partial enumeration of the subjects treated: Design Paper and Its Uses; Plain Cloth and Its Ornamentation, Twilling, Drafts and Tie-ups; Spotting; Open-work Effects; Cords; Pile Weaving; Cross Weaving; and Backed and Double Cloth. Price $2.25.

The Printing of Textile Fabrics, by C. F Seymour Rothwell. 8vo., 312 pages.

This is a practical manual on the printing of cotton, wool, silk, and half-silk fabrics, with plates, illustrations in the text, and specimens of printed fabrics. The work contains but little information of a purely chemical or theoretical character, as it has been covered by the "Manual of Dyeing," by Knecht, and others. The author has confined himself more to the practical side of the subject, and the processes and machinery described by him are principally those with which he has had practical experience. Price $6.50.

Cotton Spinning, by W. S. Taggart

Two volumes of this work have been issued; the second volume brings cotton spinning down to the end of what is generally termed the preparing processes and includes all of the machinery and manipulations between the card and the self-actor, or ring frame. This work is esteemed of much assistance to the student. Price $1.75.

Ornamental Designs for Woven Fabrics, by Stephenson & Suddards. 273 pages, 66 illustrations.

This is a text book dealing with ornamental design for woven fabrics, for the use of the student, and has been written for the purpose of suggesting helpful ideas to designers and manufacturers of textiles, and aims at bringing artistic textile work into practical touch and closer relationship with the technical requirements of manufacturing. It takes up such subjects as Geometric Design; How to Plan an All-over Repeating Design; The Drop Pattern; The Sateen Arrangements; Borders, Corners, Stripes; The Structure of Ornamental Flowers, Foliage, etc. Price $2.50.

The Power Loom, by Alexander Brown

This is a practical, well written treatise of 118 pages, on the construction of the power loom and the art of weaving, giving descriptions of the texture produced by different numbers of harnesses. The text is illustrated with diagrams, and contains calculations and instructions for the production of cotton, woolen, linen and jute fabrics. It was written with the intention of serving as a text book for those engaged in the trade. Notwithstanding it relates to English machinery, it is of value to those operating that of American make. Price $1.25.

Jacquard Weaving and Designing, by T. F. Bell. 300 pages. Fully illustrated.

The contents of this work have been derived from a long course of art and technical training, together with a lengthy practical experience in textile manufacturing and designing, by the author. The descriptions are as concise as is compatible with fairly clear explanation. Price $3.00.

Cotton Weaving and Designing, by John R. Taylor, 288 pages, fully illustrated.

This work is by a well known writer and lecturer on this subject, and treats of such topics as: Hand and Power Looms; Drop and Circular Box Looms; Dobbies; Jacquard and Leno Weaving; Terry Looms; Principles of Designing, Plain and Figured; and Textile Calculations. This work is of much value. Price $2.50.

Woolen Spinning, by Charles Vickerman.

This is a most excellent work for students in textile schools, and for skillful, practical men in woolen mills. It takes up the principles that underlie the various processes and operations of the earlier parts of manufacture. It has chapters devoted to Wool; Wool Sorting; Scouring; Bleaching; Mixing, etc., Carding and Spinning. 352 pages. Price $1.75.

The Student's Cotton Spinning, by Joseph Nasmith.

This is a standard book on spinning. It treats of mixing, opening, scutching, carding, card clothing, combing, roving, spinning, reeling, waste spinning, etc. 593 pages. Price $2.50.

Technology of Textile Design, by E. A. Posselt.

As a practical treatise on the construction and application of weaves, and the analysis of cloth, this is, in very many respects, the best work for the American manufacturer that is published. Price $5.00.

The Mechanism of Weaving, by T. W. Fox.

A treatise of 464 pages, presenting exact and practical information upon the principles of weaving. Takes up such topics as Harnesses; Shedding; Dobbies; Jacquards; Card Cutting; Picking; Pickers; Swivel Weaving; Beating Up; The Reed; Taking-up Motion; Temples; Trimming and Fixing of Parts. 256 illustrations. Price $2.50.

Manual of Dyeing, by Knecht, Rawson and Loewenthal. In three volumes.

Decidedly the best work of the kind for a proper understanding of the present state of the art of dyeing, for the use of practical dyers, manufacturers and students. It takes up such subjects as, Water; Acids; Alkalies; Mordants; Natural and Artificial Coloring Matter; Machinery used for dyeing, etc. Has numerous illustrations and specimens of dyed fabrics. Price $15.00.

ALBERT R. ELSASSER,
Clifton Worsted Mills.
WORSTED YARNS
MILLS: ADDINGHAM, DEL. CO., PA.
Phila. Office, 421 Chestnut St.

WANTED!

A copy of **August, 1896,** issue of the **Textile World.** A good price will be paid for a few copies in good condition. Send postal before sending in.

TEXTILE WORLD,
620 Atlantic Avenue, BOSTON.

Knitters Wanted. Good hosiery and underwear knitters on spring and latch needle machines, also men with experience on sewing machines. Address TEXTILE WORLD Employment Bureau.

Facts and Gossip.

—Connecticut, Willimantic. A bill in equity to foreclose the mill property of the Windham Cotton Manufacturing Co. here has been brought in the United States Circuit Court by May R. Allen of Providence, R. I. to whom a mortgage was given to secure a note of $15,000. The writ is returnable the first Monday in March. The note was dated December 1, 1896 with interest payable semi annually at 5 per cent. for 3 years. This suit is brought because, it is alleged, interest due December 1897, was not paid.

—*Georgia, Atlanta. The reorganizing committee of the Eagle Phoenix Manufacturing Co. has perfected its plan which provides that the bondholders shall buy the property at the legal sale which is to take place about the first of April. It is expected that G. Gunby Jordan will be president of the new company.

—*Georgia, Savannah. The Savannah Cotton Mill, capitalized at $100,000, which has been shut down since last May, was sold to the Southern Bank for $30,000. The bank held a mortgage on the property for $36,000. The property will be taken by a syndicate, which will operate the mills.

—*Indiana, New Albany. The New Albany Woolen Mills Co. was organized recently by William T. Grant, Joseph Sabel, David Davis, of Louisville, and J. F. Giebhart, of New Albany. The capital stock is $100,000, shares of $50 each.

—Maine, Bangor. S. A. Maxfield has leased the old salt mill of Morse & Co., with a view of establishing a large woolen washing industry. He will take possession about April 1st. It is not known definitely whether he will erect new buildings or enlarge the present structures.

—*Maine, Dexter. The property of the Dexter Woolen Mills, consisting of three mills, with water and steam power, and adjoining buildings, were sold January 11 to Wesley Judkins, for $39,000, who bought the property in interest of the bond-holders. No statement has been made as yet what will be done with the property.

Bonus.

A large bonus in money is offered by the "Board of Trade," of Fort Covington, Franklin County, N. Y., to a manufacturing company who will locate in our town. For full particulars, address

W. G. CUSHMAN, Sec. and Treas., Board of Trade, Fort Covington, Franklin County, New York.

Cotton Mill For Rent.

A large and commodious building; three miles from Wilmington, Delaware. Railroad within two hundred yards. Water power supplemented by steam. In excellent order. Building contains line shafting, but no machinery. Could be used for any light manufacturing business.

Occupied by prosperous manufacturers for fifteen years. Correspondence solicited. Address,

E. I. DuPONT de NEMOURS & CO., Wilmington, Del.

MACHINERY Shafting, Hangers, Pulleys and Couplings. Machinery Steel in all sizes from 6 1-2 inches diameter down to 3-16 inch diameter, cut any length, always in stock. Cold Rolled Rounds, Squares, Flats, Hexagons, Octagons, Decagons, and all shapes finished to exact sizes. Everything in readiness to be shipped at once. Our goods are without a rival and our prices the lowest of all.

Telephone 314, South Boston.

COMPRESSED STEEL SHAFTING WORKS,
South Boston, Mass.

Cotton Mill Wanted.

Parties wishing to locate a cotton mill in the South will do well to investigate the advantages of Tallapoosa, Georgia. Our locality furnishes best grade of cotton; has the best climate in the South; has a Northern settlement with school and church advantages; has 3000 people, free-stone water and cheap fuel. Address,

SECRETARY BOARD OF TRADE, Tallapoosa, Georgia.

Indigo Grinders.

Wanted:—Two or three indigo grinders. Give full description and particulars regarding size, condition and price.

PROXIMITY MFG. CO., Greensboro, N. C.

Presses Wanted.

Wanted:—One or two second-hand hydraulic presses, hollow steam plates, about 10 inch ram. Address,

THE ASHLEY & BAILEY CO., Paterson, N. J.

Agency Wanted.

A man thoroughly acquainted with A1 Cloak and Clothing manufacturers in New York City, having an established trade, desires to represent a manufacturer of Cotton Crashes and Canvasses. Address,

SPAULDING & CO., 11 & 13 Waverly Place, New York City.

Mill Manager — $10.000.

Wanted:—To communicate with an experienced Cotton mill man with $10,000 to invest in a mill with $100,000 capital, and who can manage the business. Cheapest fuel in the South. Address,

S. W. BOGY, Real Estate Broker, Corsicana, Texas.

MILL SUPPLY BUSINESS FOR SALE!

An old established Cotton and Woolen Mill Supply business, with very desirable connections and good line of customers, is offered for sale for personal reasons. Located in Massachusetts. Business in good shape; can do $50,000 per year. Address in confidence.

"COLUMBIA," care Textile World.

EDWARD JEFFERSON & BRO.,

Worsted .·. Machinery,

28 Strawberry Street,

PHILADELPHIA, - - PA.

SOLE AGENTS FOR

J. B. Farrar & Sons, Halifax, England,

Buggella Cork Rollers for Spinning and Drawing.

Ramie.

An intelligent and practical man, who has worked for a long time in one of the few successful factories in Europe which manufactures ramie into imitation silk, woolen and linen goods, would like to arrange with some manufacturer for the introduction of this industry. He understands all the processes from raw material to the finished goods; is able to spin the yarn up to 100s single.

Also understands how to color a fast aniline black without oxidizing, also how to color perfectly fast paranitraniline red in warps or skeins. Address

"AMERICAN CITIZEN," care Textile World.

WANTED—A Textile Writer.

Wide-awake young man with ideas and technical information to back them. Must have journalistic experience. Such a writer is wanted to act a assistant editor of a Textile journal soon to be started. The journal will be a high class publication and its field will offer splendid opportunity for competent man.

Address "NEW TEXTILE JOURNAL,"
Care of B. R. Western, 126 Liberty St., New York, N. Y.

Water Power For Sale.

100 Miles West of Chicago, on Chicago and North-Western and Illinois Central Railways, Stone buildings; 100 horsepower now running. Can have 400.

E. C. PARSONS, Dixon, Illinois.

WANTED.

A Gentleman with moderate capital to take an interest in a very desirable Yarn Commission business in New England. Address, "YARNS," care Textile World.

FOR SALE, SECOND-HAND MACHINERY.

Double Corliss Engine, cylinder 21x60 in. Single Corliss Engine, cylinder 20x48 in. Singles Corliss Engine, cylinder 16x36 in. Single Corliss Engine, cylinder 12x24 in. 30-40 50-80 and 100 H. P. Automatic Engines.

Large stock of Plain Slide Valve Engines, Boilers, Steam Pumps, Feed Water Heaters, Lathes, Planers, Shapers, Drill Presses, Milling Machines, Electric Motors and Dynamos, and Wood-working Machines. Let me know your wants as my stock is constantly changing. Yours respectully, FRANK TOOMEY, 131 No. 3rd St., Philadelphia.

Traveling Salesman.

Situation wanted by an experienced traveling salesman, who is posted in the underwear and hosiery line, and commands a good trade through Wisconsin, Minnesota, Iowa and Northern Michigan. Can furnish best of references. Age 35. Address, P 158, care Textile World, Boston.

Hosiery Mill For Sale or To Let!

A new plant, capacity 100 dozen per day.

Water Power To Let, 400 H. P., with excellent buildings.

W. K. DANA, Westbrook, Maine.

HAIR NETS

are in fashion again. We make them. Greatest variety of leading styles. Quality highest, prices lowest. Orders promptly filled.

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Frank A. Stevens, *Pres.* Arthur H. Mason, *Treas*
Capital Stock, $500,000.

Sanford Spinning Co

FALL RIVER, MASS.

30,000 Spindles. Weekly product, 50,000 pounds 14s to 40s.

NOVELTY COTTON YARNS,

FROM AMERICAN PEELERS AND EGYPTIAN COTTONS.

OUR SPECIALTY: Superior qualities of Hosiery Yarns, Natural Shades of Cottons, and in Colors, Jaegers, Mixes, and Bleached, Hosiery Cops on Long Tubes, Skeins, Tubes, Cones and Lisle Thread Yarns. Furnished in Carded and Combed Qualities in Singles, 2, 3 and 4-plies.

Yarn wound in conical form on "Universal" Machines gives perfect results in knitting and saves all re-winding.

There are no cobwebs on the ends of the cones, and therefore no waste or catching, in drawing off the yarn.

UNIVERSAL WINDING CO.,

F. H. BISHOP, Manager.

226 Devonshire St., - Boston, Mass.

YARN DEPARTMENT.

Eastern Yarn Market.

Cotton Yarn. The spinners are getting but few new orders. At present the mills are running on light weight yarn; the heavy-weight season is expected to open soon and knitters must cover themselves on yarn. Much bitterness is felt against the trust; the knitters claim that they can get no higher prices for goods, yet with raw cotton on a decline of two cents per pound, cotton yarn has been advanced by the combination 1½ cents per pound. Many of the knitters declare that they will not buy from mills in the combination.

They say they can use Southern yarn with as good results as from Northern yarn, and they will not have to pay so much money for it. To a desirable customer, or a large user, there are many ways the spinners work round the combination prices. For instance, yarn made from cotton waste is not combination yarn. Mills will sell cotton waste yarn at a given price and deliver straight cotton yarn, but the yarn is called cotton waste yarn. Again, if a mill is using 1-9½, the combination price is listed so much on every half number. The salesman will quote the combination price on 1-9½, but will say that it is all right; you buy 1-9¼ and we will meet your idea on price, because the combination is not on the quarter numbers.

Knitters are kicking against the Utica combination on cheap ladies' shirts. The regular price is $2.50 net, for regular goods. These mills manufacture an inferior article, trim it like the regular goods, and sell at $1.90 per dozen net. This is damaging to the business of those who stick to the standard quality.

Season before last can be truly called the cheap season. Knitters would get offers on garments and make offers to spinners for yarn based on the cheap garments and the spinner generally made the yarn at the knitter's prices. The buyer has been educated up to this sort of thing and it remains to be seen whether they can be convinced that they cannot work the "racket" again.

Prices in meantime for yarn are firmly held. Ladies' garments call entirely for white and silver-gray, the Jaeger for ladies' garments seem to have gone out. This is not so, however, on men's wear. The demand continues for Jaeger fleece lined. We understand that fleece lined cotton garments are not being looked upon favorably, as heretofore.

Knitters claim that although the spinners of the North cannot control white cotton yarn, they can control Egyptian yarns.

We believe that the flat goods' mill will make mostly two-threaded garments, from 1-20 and 1-22 yarn. The ladies' ribbed underwear will run 1-8 to 1-9's and men's, 1-10's. The spinners of combed yarn both in Egyptian and Allen seed are busy on light weight yarn. Knitters are busy and are booking reorders freely. Prices are well maintained and are advancing.

Here are some interesting facts regarding Peruvian cotton. This cotton is being held for higher prices, but owners should not finesse too close, because the rains which come at regular periods are now on, and 1898 will be the big crop year. Planting will begin soon and the first of the crop will come forward in October. Until that time this article will be scarce; ofter that the "woods will be full of it."

We quote

7/8 white cops	. . . . .	12½	cts.
10s " "	. . . . .	13	cts.
12s " "	. . . . .	13½	cts.
14s " "	. . . . .	14	cts.
16s " "	. . . . .	14½	cts.
18s " "	. . . . .	15½	cts.
20s " "	. . . . .	16	cts.

Continued on page 131.

Frank E. Patterson, Prest. Oscar W. Wood, Treas

Germantown Spinning Co.

COTTON CARDED

HOSIERY YARNS

In numbers from 6s to 26s.

Germantown, Philadelphia.

Glazed, Bleached and Dyed

YARNS

Cone Winding.

W. WARREN THREAD WORKS.

WRITE US WHAT YOU USE, WE WILL DO THE REST.

WESTFIELD, - MASS.

WOOLEN YARNS.

Single, also Double and Twist For Weaving Hosiery.

COVERT CLOTH YARNS A SPECIALTY.

Raw Stock and Piece Dyeing.

CLEAR RIVER MILLS,

PASCOAG, R. I.

(Continued from page 129.)

Silver gray and Jaeger.

10, 11, 12	15 cts.
14	15½ cts.
16	16 cts.
18	16½ cts.
20	17 cts.
Combed Egyptian, 1/20,	23 cts.
" " 1/30,	29 cts.
" " 1/40,	33½ cts.
" " 1/50,	36 cts.

Woolen Yarn. Spinners have been getting some good orders from weavers for delivery during the heavy weight season, also sample orders of various kinds from knitters. Many of the consumers of yarn, place orders for sample lots and then work for orders for goods, and if these are secured, orders are then placed for yarn. Many of the mills have placed orders for yarn, taking chances about getting orders for goods; delivery of the yarn to be made later. Many of the spinning mills cannot, however, accept orders in this way, as it requires the locking up of too much money. Manufacturers who are running their mills full, state that if they were forced to purchase raw material on the present market, they would be unable to run at all. Everyone is looking for higher prices. The knit-goods trade opens up later than the heavy weight men's wear. Spinners, undoubtedly, will have a good season as soon as orders begin to arrive. At present, orders are mostly for samples although some good sized orders have already been placed. The coarser grades are being ordered first, and the finer qualities will sell in quantities probably in February and March.

Worsted Yarn. Spinners have received many orders from weavers before orders are secured on the goods. Buyers of cloths are seeking to buy light weight at old prices, and every expedient is being devised by the weavers to meet them, such as lowering the quality a little and using single instead of two-ply yarn. Most of the orders of yarn for the start off of the season have already been placed. The heavy weight samples are being opened and some of the mills have

(Continued on page 133.)

CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
216 Church St., New York.
206 Chestnut St., Philadelphia.

SAWYER, MANNING & CO.,
YARNS,
86 & 88 Franklin St., NEW YORK

ALEX'R KING & CO.
YARNS.
FINE IMPORTED YARNS A SPECIALTY.
54 Leonard St., New York.

JAMES E. MITCHELL & CO.,
Commission Merchants.
122 & 124 Chestnut St., Philadelpia, Pa.
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Cotton, Woolen & Worsted Yarns.
All numbers on Hand and Made to Order.

O. S. HAWES & BRO.,
WEAVING and HOSIERY YARNS,
All Plies and Numbers.
Imported Yarns a Specialty.
82 and 84 BEDFORD ST., FALL RIVER, MASS.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON WARPS
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON
YARNS 42s and above. AND
FITCHBURG, MASS. WARPS

E. Jenckes Manufacturing Co.
COLORED COTTON YARNS.
Cops and Cones.
PAWTUCKET, - R. I.

CAPACITY, 50,000 Spindles.

ORSWELL MILLS

FITCHBURG MASS.

COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

SILK LUSTRE COTTON YARNS

In single and two or more plys. This yarn retains its lustre through all usages and is increased in strength twenty to forty per cent.

High Grade **COTTON WARPS** and **NOVELTY YARNS.**

Printers of Cotton, Wool and Worsted Yarns.

The J. R. MONTGOMERY CO.,

. . . . . WINDSOR LOCKS, CONN.

Cotton Yarns AND WARPS Of Every Description.

James F. White & Co.

COMMISSION MERCHANTS,

54 an 56 Worth St., NEW YORK.
228 Chestnut St., PHILADELPHIA.

BURLAPS all WIDTHS and WEIGHTS.

Cotton Warps.

WHITTIER COTTON MILLS, LOWELL, MASS.

INDIAN ORCHARD CO.,

Indian Orchard, Mass.

MANUFACTURERS OF

Lustred Cotton Yarns.

In Various Colors and Twists.

Cotton Warps and Yarns

In Gray and all colors, single or 2, 3, 4 and 6 ply, and Cable Cord.

NOVELTY YARNS

In Cotton, Silk and Worsted, in various patterns and colors.

COLORED COTTON

Machined, Carded or in Roving.

(Continued from page 131.)

been taking orders. We hear of a Lawrence mill securing 18,000 pieces of Cheviot clays in one week at $1.10 per yard. Kerseys sold at $1.30 per yard. Salesmen for spinners are working the trade quite vigorously and prices have advanced again. Before June, it is thought that $1.10 per pound for 2-40's will be the importing price. French spun yarn, single, will bring this price. We believe that many cheviots will be used and much ¼ and ⅜ blooded yarn has been sold at prices ranging from 57½ cents to 62½ cents. Some spinners claim that yarn cannot be made for less than 62½ cents, at present prices of work. The difference of opinion as to what spinners call ¼ and ⅜ blood, no doubt has much to do with the price. Weavers are looking for a good business, but at this writing, with samples just on the market, no estimates can be made. Many of the leading mills making fine goods are offering some beautiful lines of fancy worsteds, to meet the public demand for fancies. As soon as the present orders have been filled or nearly filled, worsted yarn will advance to full prices. Knitters have been buying French spun yarn, and prices are firmly maintained. Worsted hosiery seems to be taking very well and a large business will be the result. Dress goods are not doing so well, but this is the off season. For cloakings much 2-14, ¼ blood and lustre yarn will be used, and orders are being placed. Astrachans will soon be on the market and a good business for lustre yarn will be the result. It is the opinion of every one that if we have any business at all, worsted yarn will be a scarce article, and prices will range high. Many Rhode Island Mills are running cotton worsteds. The profit

(Continued on page 135.)

KERR THREAD CO.
—SPINNERS OF—
Fine Combed Sea Island **COP SINGLES**
All Numbers, 30s to 150s.
Fall River, Mass.

WOOLEN AND MERINO YARNS.
Special line for Bicycle and Golf Goods in all shades
For Hosiery, Gloves, Underwear, and all kinds Knit Goods. Cop, Cone and Skeins.
The J. & H. Clasgens Co.
New Richmond, O.

WOOLEN YARNS.
All grades Woolen, Mixed and Merino yarns.
15 SETS CARDS.
EDWARD M. ROCKWELL,
LEOMINSTER, - MASS.

A. HERBST. J. W. JONES.
HERBST & JONES,
Successors to Kershaw Worsted Co.
WORSTED YARN SPINNERS,
21st & Nandain Streets,
PHILADELPHIA.

C. MOORE & CO.,
MANUFACTURERS OF
TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.,
Philadelphia.

EICHMANN & STERNBERG
530 Broadway cor. Spring St., NEW YORK.
Plain and Gassed Cotton Yarns,
HOSIERY COTTON YARNS,
Mercerized Cotton Yarns (Simile).

COTTON WARPS
White or Colored.
Toweling and Grain Bags.
Dana Warp Mill,
WESTBROOK, MAINE.

MONUMENT MILLS,
Manufacturers of
White, Colored, Fancy and Double and Twist,
COTTON WARPS
4s to 60s.
HOUSATONIC, MASS.

HADLEY
SPOOL COTTON AND FINE YARNS
COMPANY
COTTON SPINNERS.
MILLS AT HOLYOKE, MASS.

SPINNERS OF
FINE COTTON YARNS
30s TO 100s.
Gray, Bleached, or Colored. On cop, in skein on spools, cones or tubes.
Fine Cotton Warps, single and two-ply, in chain, etc.
Spool Cotton and Seaming Thread.
95 Milk St., BOSTON.

THE WILLIAM CLARK COMPANY,
WESTERLY, R. I.
Mills equipped with the latest and most improved machinery.
Combed Egyptian from No. 20s to 100s. Combed Sea Island from No. 40s to 200s.
Also 2, 3, 4, 5 ply and 6, 9 and 12 ply cable laid.
Hosiery Yarns on Cops Tubes or in Skeins, Grey, Bleached or Dyed. (Fast Colors.

GREENE & DANIELS MFG. CO.,
COMBED, CARDED AND GASSED
Yarns, Threads, Twines and Chain Warps,
Colored and Bleached Yarns Furnished in any manner desired by the trade. PAWTUCKET, R.I.

GEORGE SHIMER & SON,
Spinners of Worsted Yarn for the Weaving and Knitting Trade.
All kinds of Fancy Yarns for the Knitting Trade.
5th and Erie Sts., Camden, N. J.

YARNS
SOLIS - - BOSTON.
179 Devonshire Street.
ANDREW J. SOLIS, Jr. & CO.

Walcott & Campbell Spinning Co,
IROQUOIS MILLS.
FANCY HOSIERY YARNS
IN ALL COLORS.
New York Mills, Oneida Co., N. Y.

YARNS All Numbers and Qualities.
HOLLAND & WEBB,
478 Broadway, New York.

Eddy & Street,
COTTON, WOOLEN, YARNS AND BRAIDS WORSTED, SPUN SILK.
PROVIDENCE, R. I.

NEW ENGLAND THREAD CO.
PAWTUCKET, R. I.
Manufacturers of Spool Cotton & Supefine Tapes
Thread and Yarn on Tubes and Cones for the Hosiery trade etc. Thread dressing a specialty, for weaving purposes. Dyers and Bleachers of Threads, Yarns and Tapes.

A copy of the Textile World's Directory is presented to every paip-up subscriber of the Textile World, with the compliments of the publishers.

(Continued from page 133.)

is not so great on this class of goods as when first introduced. The original manufacturer of this class of cloth, made $1.00 per yard and made so much that he did not dare to run his mills nights, for fear that some of his competitors would find out about it. Prices for worsted yarns are firmly maintained. Business is good and will be much better.

We quote:

2/40s Australian	$1.07½
2/50s "	1.15
2/20s, 3/8s Blood	.60
2/36s, 1/2 "	.75

Philadelphia Yarn Market.

The continued low price of cotton, has induced spinners, on some yarns which are not the highest grades, to shade the price, in the past 60 days. In warps, this is in such goods as have been advanced most. In hosiery yarns, it has generally been such goods as did not advance so much as the finer qualities. However, prices have remained fairly firm all around, and a continued large business has been done. We quote:

WARPS.

20s	12½ to 13 cts.
22/1	13 cts.
26/1	14 cts.
12/2	13 to 13½ cts.
14/2	13½ to 14 cts.
16/2	14 to 14½ cts.
14/1	12½ cts.
16/1	12½ cts.
20/2	15½ to 16 cts.
30/2	18 to 18½ cts.
30/2 Eastern	18½ to 19 cts.
40/2 Eastern	23½ to 24 cts.

(Continued on page 137.)

O. H. Hayes & Co.,

We will make liberal arrangements with Woolen Manufacturers to handle their productions.

O. H. Hayes & Co.

B. F. BOYER & CO.,

Successors to GEORGE SHIMER & BOYER.

HOSIERY YARNS,
In Wool, Merino and Worsted.

GOLF YARNS,
In Wool and Worsted. Also carry a full line

BUNDLE YARNS
For the Jobbing Trade.

516 Market St., Philadelphia.
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Commission Merchants,
Trimmings, Buttons and Knit Underwear.
Sole Agents for
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Specialties:
SCOTCH MIXTURES
For Sweaters, Golf and Bicycle Hose, Mitts, Gloves, etc.
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Fine Worsted Yarns,
— AND —
Fine Woolen Yarns
— IN THE —
GREY, COLORS and MIXTURES.

Cohannet Mills,
TAUNTON, MASS.
Spinners of High Grade
HOSIERY YARNS OF EVERY DESCRIPTION.
Selling Agents JAMES E. MITCHELL & CO., Philadelphia and Boston.

THE PHOENIX MILLS CO.,
MANUFACTURERS OF
Fine Worsted Yarns.
Correspondence Solicited. Samples furnished on application.
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MILLS: 10th & Germantown Ave., Phila. Chester, Pa.
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HOWLAND CROFT, SONS & CO.

LINDEN WORSTED MILLS.

Fine Worsted Yarns

OFFICE AND MILLS:
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Thomas Wolstenholme, Sons & Co.,
MANFRS. OF

Worsted YARNS,

ALL NUMBERS
SINGLE AND TWO-PLY,

Sell Direct,

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Worsted and Mohair Yarns—white or colors, in skeins, on spools, cones, or shuttle bobbins.

NOVELTY YARNS—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making Yarns only.

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BRISTOL, R. I.

George Campbell & Co.

Worsted Spinners,

Yarns, both French System and Bradford.

Knitting Yarns in all Grades and Mixes.
All Numbers to 60s.

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MALCOLM MILLS CO.,

MANUFACTURERS OF

Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.

Mills, Frankford, Pa. Office, 229 CHESTNUT ST., PHILA.

Continued from page 137.

SKEIN.

26/1	14 cts.
20/1	13 to 13½ cts.
19s	13 to 13½ cts.
4s to 10s	11½ to 12½ cts.
12s soft	13 to 13½ cts.
20/2	15 to 15½ cts.
14/2	12½ cts.
30/2	18 cts.
30/2 Eastern	18½ cts.
26/2	17 cts.
40/2	23½ cts.
8/3 carpet	11 to 11½ cts.
10 double reeled	12 cts.
16/3 slack	13 cts.
16/4 medium	13 cts.
16/2	13 to 13½ cts.
9/4 slack	11 cts.

SOUTHERN CONES.

6s to 8s (according to quality)	12½ to 13 cts.
10s	13 to 13½ cts.
12s	13½ to 14½ cts.
14s	14 to 15 cts.
16s	15 to 16 cts.
20s	16 to 17 cts.
24s	17 to 17½ cts.
26s	17 to 17½ cts.

SHUTTLE COPS.

6s to 8s	12½ cts.
12s	12¼ to 13 cts.
16s	13 to 13½ cts.
26s	14 cts.
40s	18 to 19 cts.

MIXED COLORED CONES.

6s to 8s	14 cts.
10s	14 to 15 cts.
12s	14½ to 15½ cts.
14s	15 to 16 cts.

Egyptian, carded, 4 to 5 cts. above white.

Combed yarns, 4 to 5 cts. above carded.

Woolen and merino yarns extremely dull.

Worsted is in good demand. Spinners are still busy, although not as much pushed as 60 days ago. They have gotten a slight advance and expect a further advance when all the cheap stock is out of the market.

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IN WHITE AND COLORS.
MOHAIR LOOPS, KNOTS, AND FANCY YARNS FOR DRESS GOODS AND CLOAKINGS.
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We Buy for Cash
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COLORED YARNS for HOSIERY
on Cones, a Specialty.
Correspondence Solicited.
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Manufacturers and Dealers in
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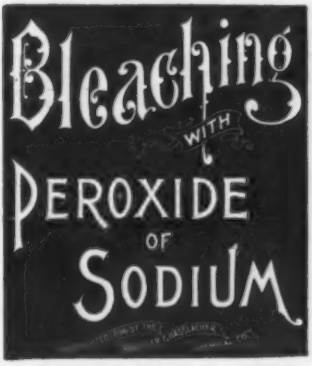

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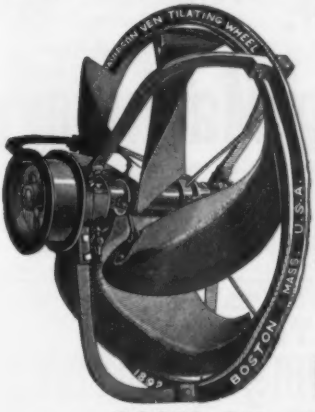

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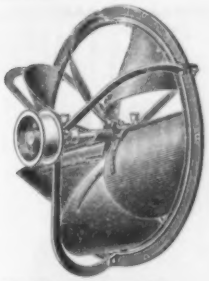

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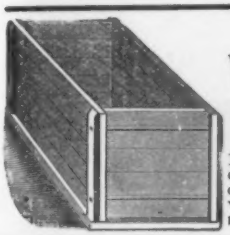

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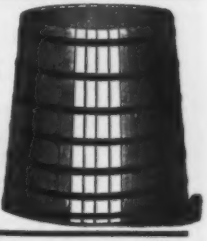

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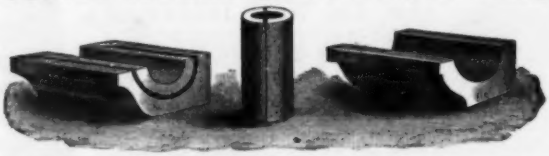

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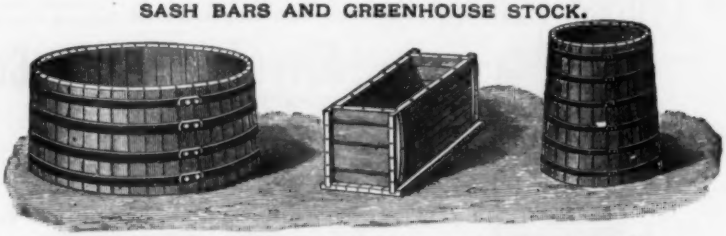

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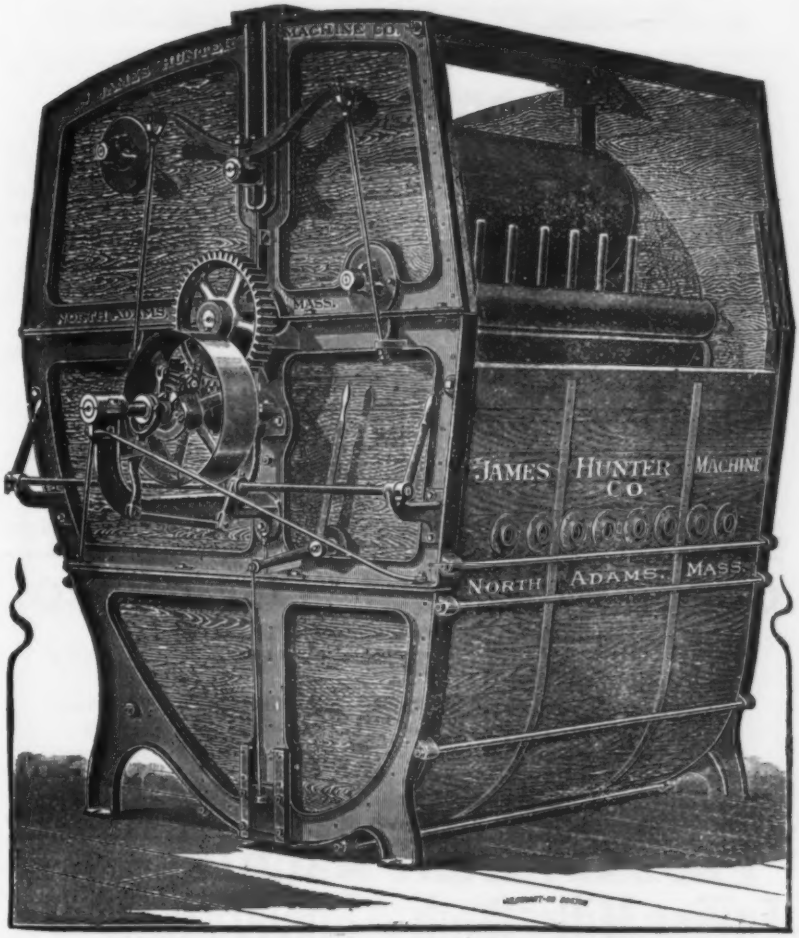
For Four, Six and Eight Strings of Goods.



Power transmitted by means of a Friction Pulley.
No Shifting of Belt to start and stop the machine.
Less power required than for any other Washer of equal capacity.
All Main Bearings are adjustable. All Bearings are on the outside of frames.
No dripping of Oil on the Goods, or in the Wash Box.

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Self-Acting BALLING MACHINE,

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The attention of Woolen Manufacturers is invited to these Machines as convenient labor-saving appliances. The machine can be adjusted to make any size balls to suit lots, and the creel is constructed to carry twice the number of spools used by the old system. Send for circular.

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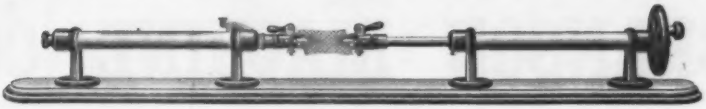

Every manufacturer has had experience at some time with tender goods, entailing claims, expense in replacement, and great annoyance to manufacturer and customer. This can be prevented by the use of the

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The clothing manufacturers expect goods that will stand a strain of 20 lbs to the inch, and if they don't come up to that test, are likely to be classed "tender." This machine enables you to know how your goods test by the same standard that the clothiers use, viz: THE HERCULES.

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PRICE $25.00 WITH OAK CABINET.

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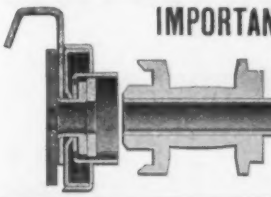

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The Bamford Dust Proof and Self-Lubricating Spindle Tube saves oil, prevents clogging with dust and lint, thereby insuring longer life to the tubes, saves labor, maintains uniform speed, **and most important of all,** makes PERFECT YARN. Have been adopted by the largest New England manufac urers a ter a thorough trial.

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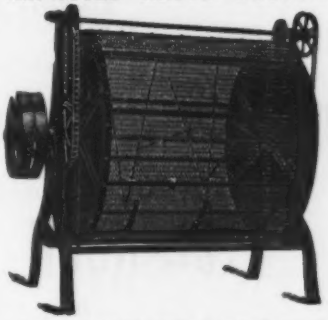

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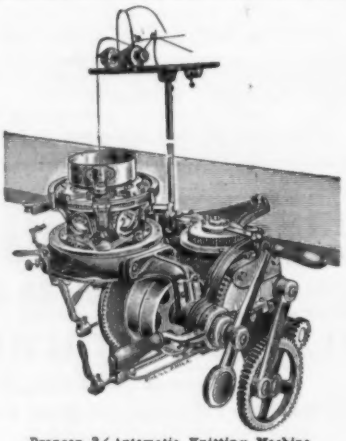

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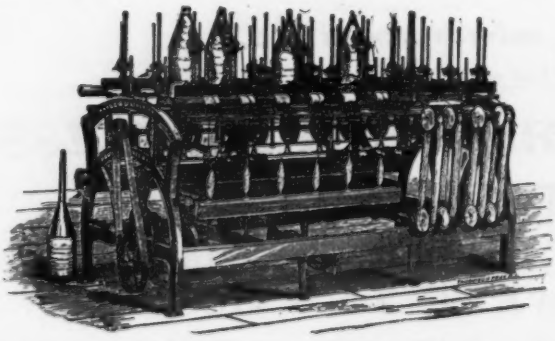

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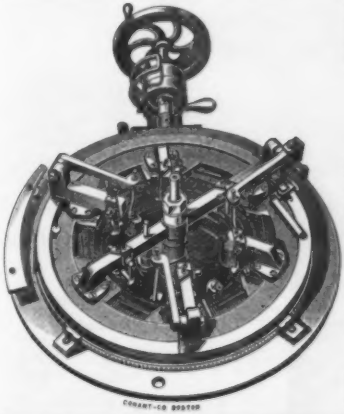

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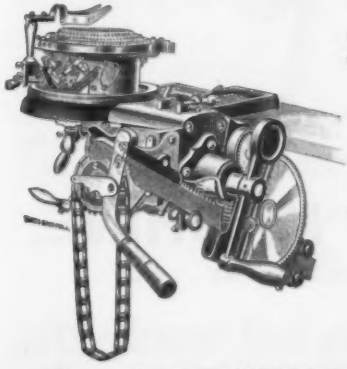

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With or without Double Sole Attachment.

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Produces the greatest variety of seamless hosiery of all kinds and gauges. This machine will produce anything from a short foot to the longest hose without substituting or changing any parts whatever.

Its Range of Work is from very coarsest up to 200 needle cylinders.

It is unequalled for either Coarse Socks or Finest Ladies' Hose.

We invite Comparison All Along the Line.

Seam in heel and toe remarkably strong and close, and heel is large and full.

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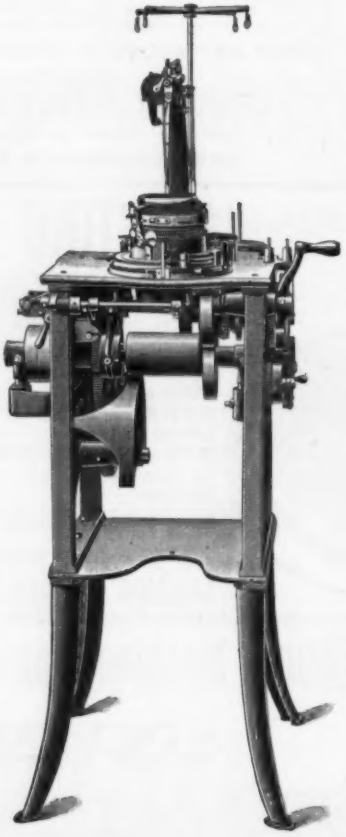

High Spliced Heel and Double Sole.

It has the *only* perfectly practical *automatic device* for changing the yarn in heel and toe.

It is Extremely Easy on Yarn

Light Running, Simple, Durable, and Economical.

A mill fitted with our machines can produce a far greater variety of weights and styles than any other machine on the market.

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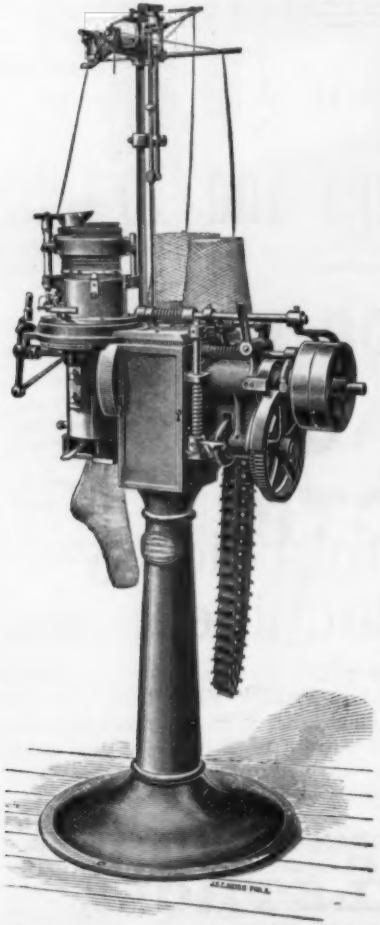

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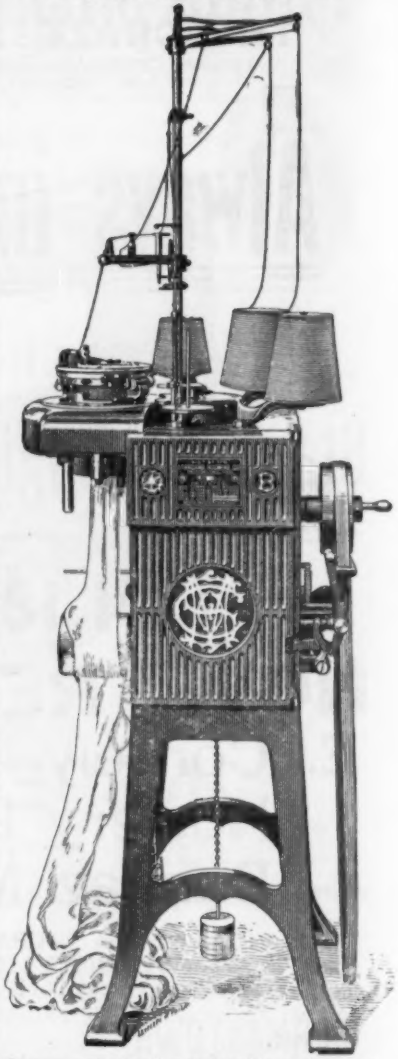

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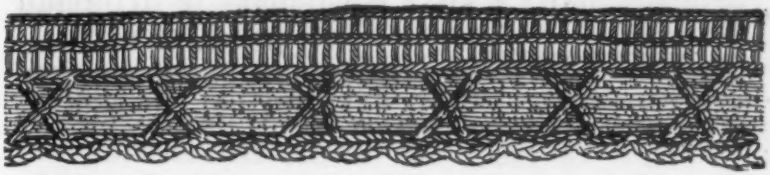

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NOW READY FOR INSPECTION.

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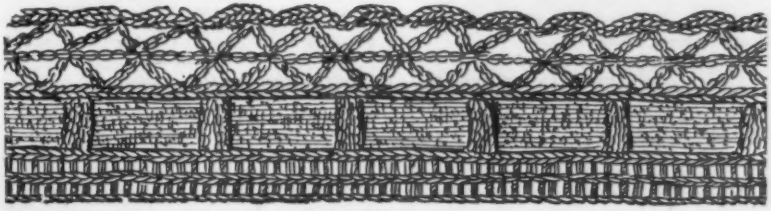

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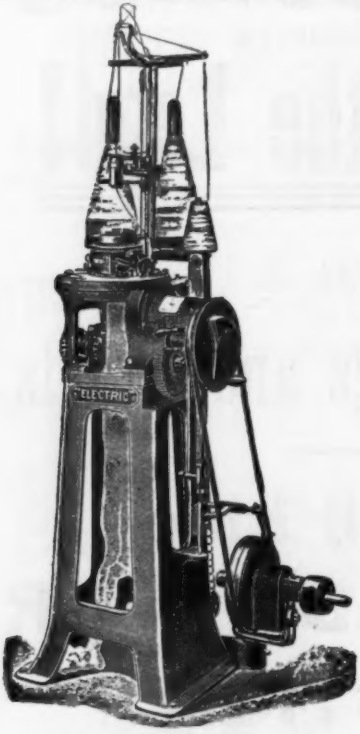

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AUTOMATIC KNITTING MACHINE

FOR

Seamless Hosiery, Wool, Cotton or Silk,

From the Coarsest to the Finest Gauge

Among the many strong claims for this machine are

The Highest Speed,
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ESTABLISHED REPUTATION FOR

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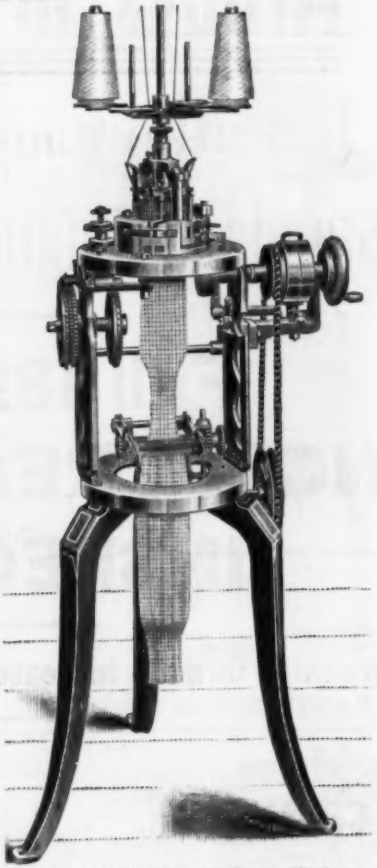

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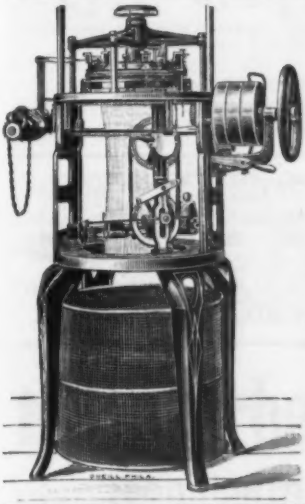
Makers of Wrought Steel Cylinders and Dials for all kinds of Machines.



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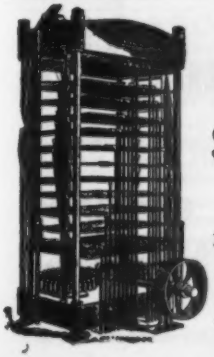

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CRAWFORD Hollow Plate Steam Press

For Knit or Woolen Goods

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HAVE THEM ELECTROTYPED BY

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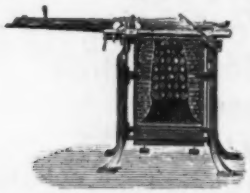

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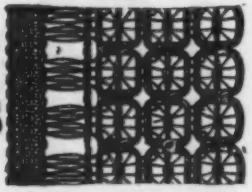

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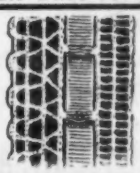

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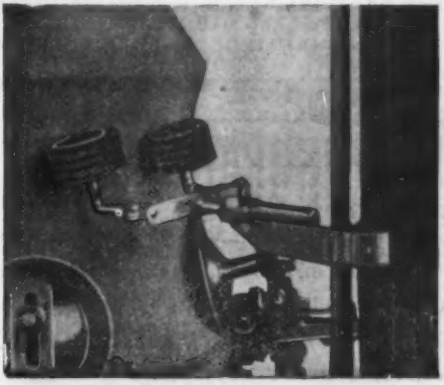

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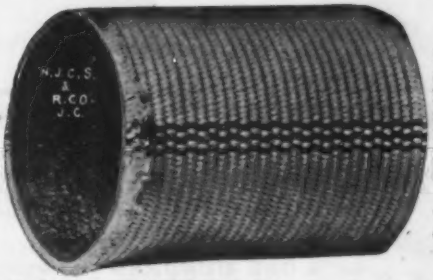

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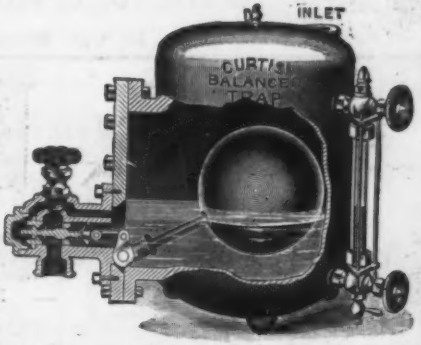

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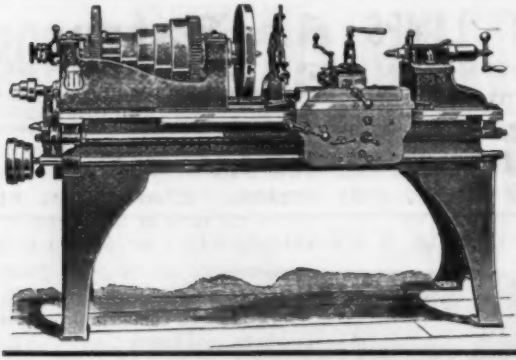

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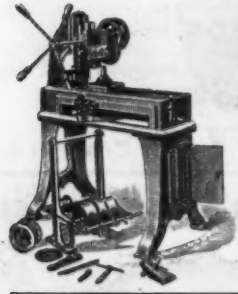

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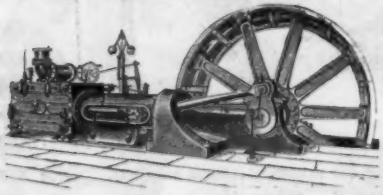

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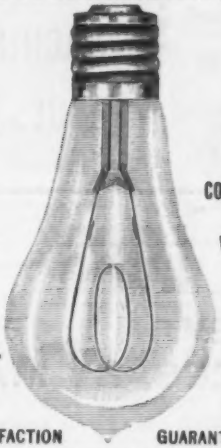

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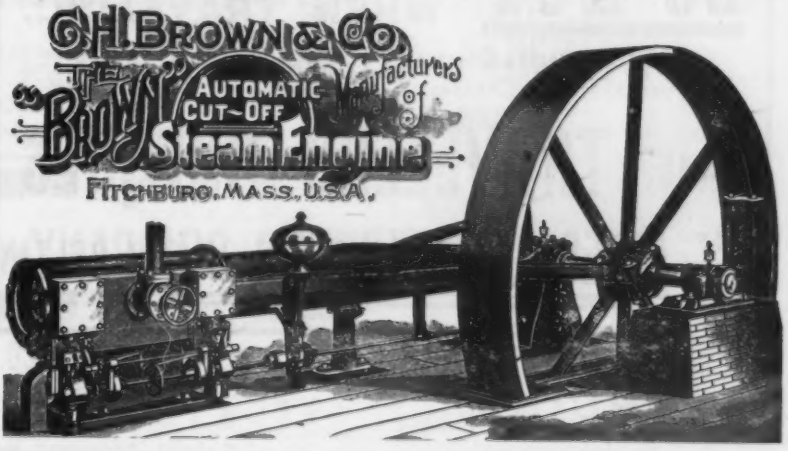

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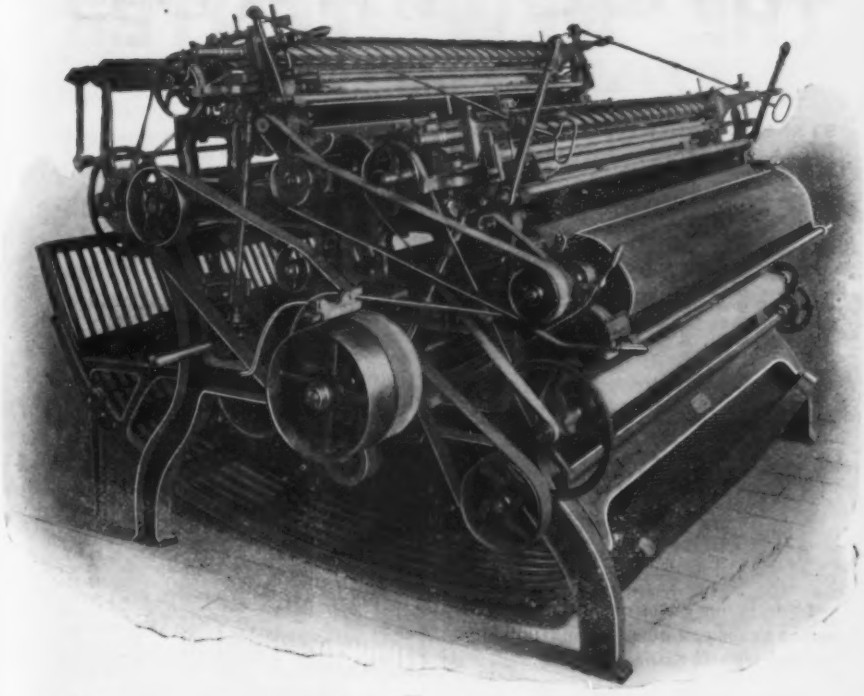

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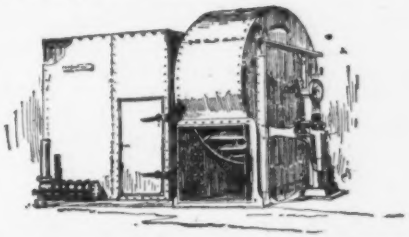

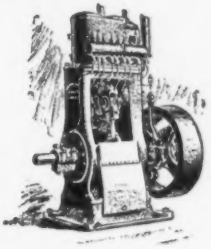

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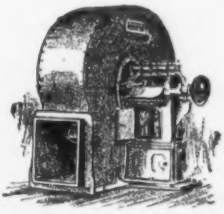

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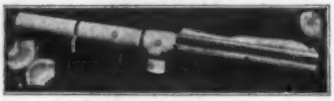
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